REPAIR MANUAL
of the
GOODRICH
SILVERTOWN
CABLE CORD
TIRES

TRADE MARK

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REPAIR MANUAL

FOR THE

GOODRICH
SILVERTOWN
CORD TIRE

TRADE MARK

Revised Edition

THE B.F. GOODRICH RUBBER COMPANY
FACTORIES: AKRON, OHIO

Why This Manual?

SO widespread has become the use of the Silvertown Cord Tire and so great are its possibilities for phenomenal service even after a serious injury—when properly repaired—that The B. F. Goodrich Rubber Company wishes to conserve the interests both of repairman and customer by a clear statement of the methods necessary to insure satisfactory results.

Such progress has been made both in construction and repair methods that little special equipment is now required for accurate work. The processes have been simplified to save the repairman time and expense and to preserve the original appearance and workmanship of the tire.

These changes—particularly in replacing cord sections—do not involve unheard-of processes, but *they do require the careful attention and study of every repairman.*

The ease of the repair will amply repay the extra effort in learning the best methods.

A BRIEF DESCRIPTION OF THE CLINCHER TYPE CONSTRUCTION

All casings are built up on steel cores, or forms, to give them the proper size and shape. The steel core is provided with detachable side rings, which hold steel staples while the tire is being built. These staples help to keep the beads in place and are galvanized to prevent rusting.

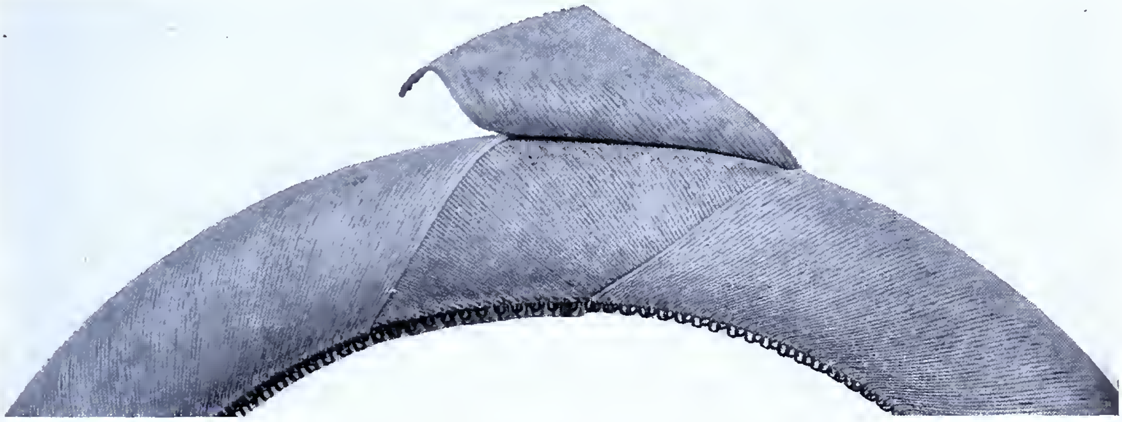

FIG. 1. HOW THE CORDS LAY (GUM SHEETS BETWEEN LAYERS REMOVED)

After the core and rings have been assembled, and before any cords have been laid, a sheet of pure gum is stretched completely around the outside of the core, down to the staples on each side; this rubber sheet becomes the lining of the tire. The core is now placed on the cord-laying machine, which beyond doubt is the most ingenious machine ever used in the manufacture of tires.

An arm of this machine draws the cord from a steel spool and folds it into a loop. As this arm swings across the core, the looped cord is caught by steel fingers, brought down and hooped over the staples. Other steel fingers then draw the cord back along the core, close to the others, allowing the next loop to drop into its place, and so on. The cords are laid under an even tension across the core and around its entire circumference at an angle of about 45 degrees. (See Fig. 1.) After the first ply of cord is laid, two sheets of pure gum are applied to act as a cushion between the plies. The second layer of cord is applied, at

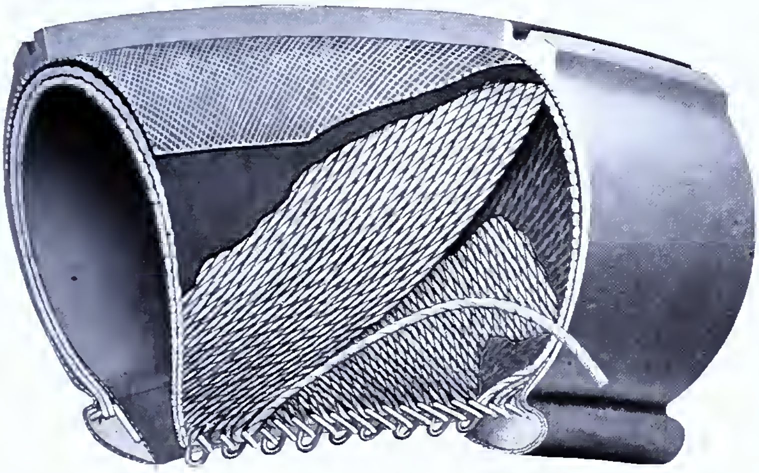

FIG. 2. CLINCHER TYPE

right angles to the first. (See Fig. 1.) The core is now placed on the building stand where two layers of pure gum cushion stock, the breaker strip and tread are applied. The detachable rings and core are then removed and the carcass is sent to the beading department. Here the beads, bead covers and side strips are put on. The bead of the Clincher Cord Tire is made up entirely of fabric, with a small amount of hard rubber in the channel and lip. The steel staples, over which the cord is looped by the cord-laying machine, are fitted into a slot under the channel of the bead, so that when the tire is vulcanized the cord loops will be held securely, without interfering with the flexibility of the bead. The beading or finishing consists of the following operations:

First. The fabric protection or stiffening strips are applied on the inside of the tire, covering the staples.

Second. The bead is put on by fitting the slot in the bead over the points of the staples and stitching the lip of the bead to the side-wall.

Third. The first ply or open weave bead cover is applied.

Fourth. The close weave or second ply bead cover is applied; this starts a little lower on the side-wall than the first ply and extends completely around the bead and over the stiffening strips on the inside of the tire.

Fifth. A narrow strip of pure gum is lapped over the edges of the bead covers on the side-wall.

Sixth. The side strips are lapped over the edges of the tread and stitched down to the channel of the bead.

Seventh. The tire is next sent to the Curing Room, where it is vulcanized under heavy pressure.

Eighth. The rough edges are trimmed, the flap inserted, and the inside painted.

Now the tire is ready for use. (See Fig. 2.)

A Brief Description of Straight Bead Construction

There is but little difference between the construction of the Straight Bead Cord Tire and the Clincher Cord Tire except at the beads. No staples are used in the Straigh Bead type. Each cord as it lies in the tire at an angle of 45 degrees, is a unit in itself. This may be seen by examining Fig. 3 closely. The outer cords pass down along the side of and under the bead, where they end; and also meet the inner cords. The wire-cable bead cores lie between the two layers of cords as shown.

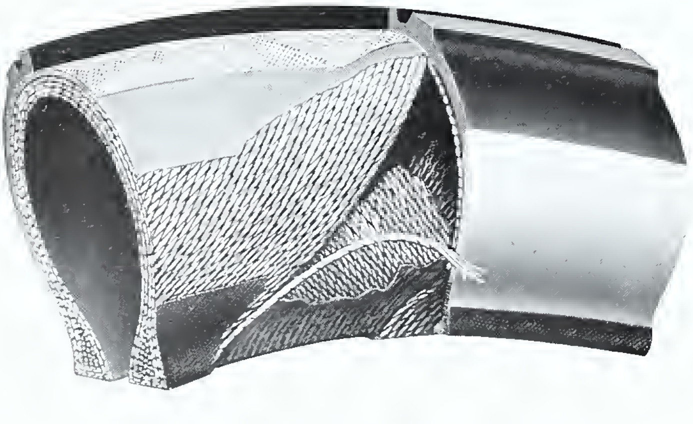

FIG. 3. STRAIGHT BEAD TYPE

The illustration (Fig. 4) accompanying these remarks is to enlighten repairmen concerning the construction of the Straight Bead Silvertown Cord tire.

The bead core has been exposed and the outer ply of cords laid back to show that the ends of the cords composing the inner ply, pass around the toe of the bead and part way across the base towards the heel. The outer cords cover the heel and pass around the toe up the inside of the bead for a distance of about ¾″.

With this explanation of the bead construction of the Straight Bead Silvertown Cord tire it is hoped that repairmen will not encounter any difficulty in making their repairs.

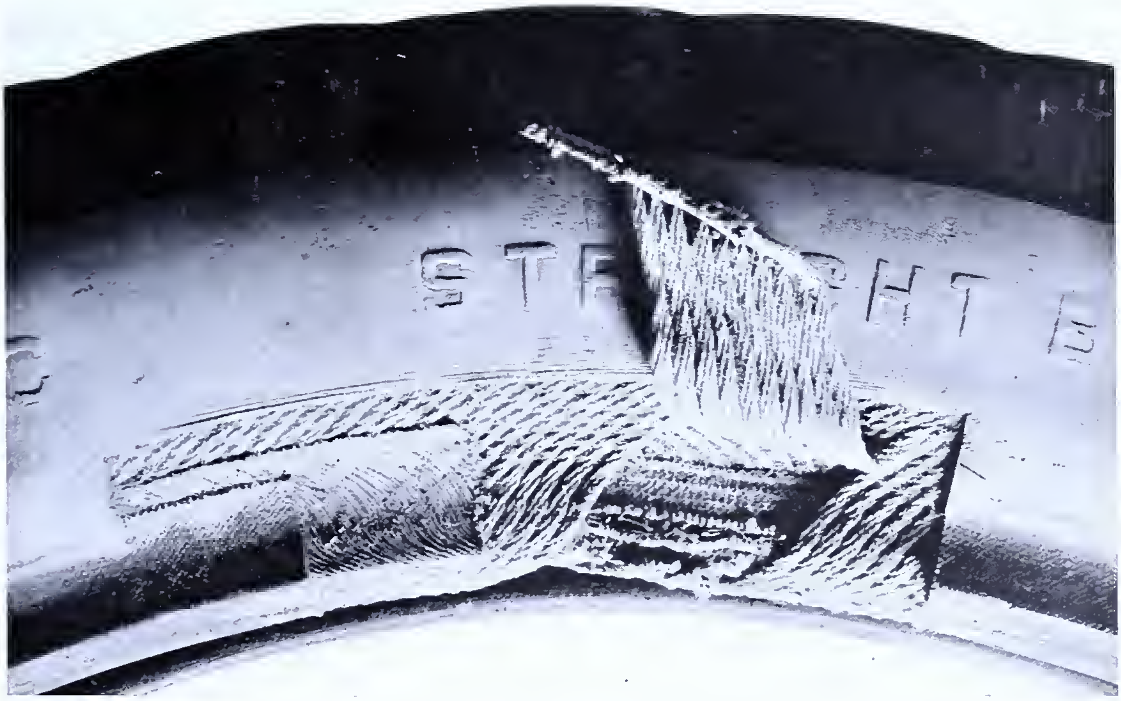

FIG. 4. SHOWING BEAD COVER REMOVED AND CORDS LIFTED

Examination of Casings

It is very necessary that the Cord Tire should be thoroughly examined before the work of repairing is started. Sometimes a repair which promises to be good is spoiled on account of an overlooked cut or cord separation.

The first step should be to examine the tread to detect any looseness, and any damage to the cords because of it; also to discover surface cuts and their effects. These cuts should be opened with a large marking awl to learn whether or not one or both plies, or layers, of cords have been cut. Next, the side-walls, bead covers (chafing strips) and beads should be examined, at the same time noting rim cuts, torn chafing strips or side-wall cuts. In fact anything which requires repairing. The final step is the examination of the inside of the tire for possible cord separations, breaks or cuts. The best way to find these injuries is to turn the tire inside out, hang it on a bench block and make tests by trying to lift the cords with an awl at numerous places around the entire inner surface of the tire, from bead to bead. Tires that have been ridden while under-inflated will show more or less cord separation or cord breaking along the side-wall between the bead and tread.

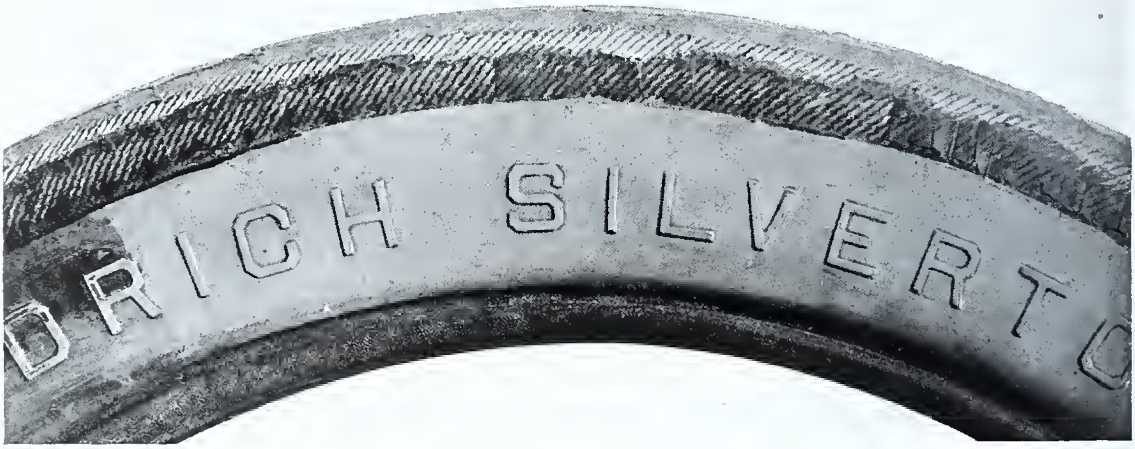

FIG. 5. CORD TIRE CUT DOWN FOR RETREAD

Retreading Cord Casings

Cutting Down:

Unlike a fabric tire, the tread on a Cord Tire cannot be pulled off—*it must be cut off in strips;* care must be taken during this operation not to cut into the outer ply of cords.

To insure neatness and evenness along the tread line of the old side-wall, scratch a line around the entire circumference of the case. To do this, set the points of a pair of dividers to the desired width of the side-wall to be left, follow the channel above the bead with one pointer and mark the line with the other. See the "Side-Wall Table" on Page 13. Now hang the case on a bench block and cut through the tread and breaker strip into the cushion gum, just to the outer cords. A convenient way to start stripping the tread is to cut through one of the outside Ribs or bars, holding the knife as shown in Fig. 6. Cut around the case between the breaker strip and the cords, leaving the old side-wall stock, if in good condition, above the clinch as follows: (See Fig. 5.)

Side Wall Table

	WIDTH OF SIDE-WALL	
Size Casing	"A" Section	"B" Section
3½	$1\frac{13}{16}$	...
4	2⅛	...
4½	2⅜	2⅝
5	2⅞	3⅛
5½	2⅞	3⅛

NOTE.—Silvertown Cord Tires mold-marked with the letters "A" or "B" appearing immediately after the size figures on either the outside or the inside of the case take the respective measurements listed above. Casings having no letter following the size are understood to be in Class "A."

NOTE.—Casings marked on the outside for 34 x 4½ "C" are cured over 35 x 5 mold and take 5" "B" cord sections for repairs.

"C" cases are as follows:

"C" sections equal to "B" sections.

32 x 4½	33 x 5
34 x 4½	35 x 5
36 x 4½	37 x 5

Now buff the outer cords clean, using a medium stiff, wire buffing brush. Do not use a rasp or a brush that is stiff and heavy. Skive, or bevel, the upper edge of the side-wall gum for the tread lap, and roughen. The outer ply of cords should be sufficiently roughened with a medium or second-cut file. Note:—Care must be taken not to to weaken the cords by too much roughening. Remove any dirt or loose fibres of cotton with a brush. The result will be as shown in Figure 7.

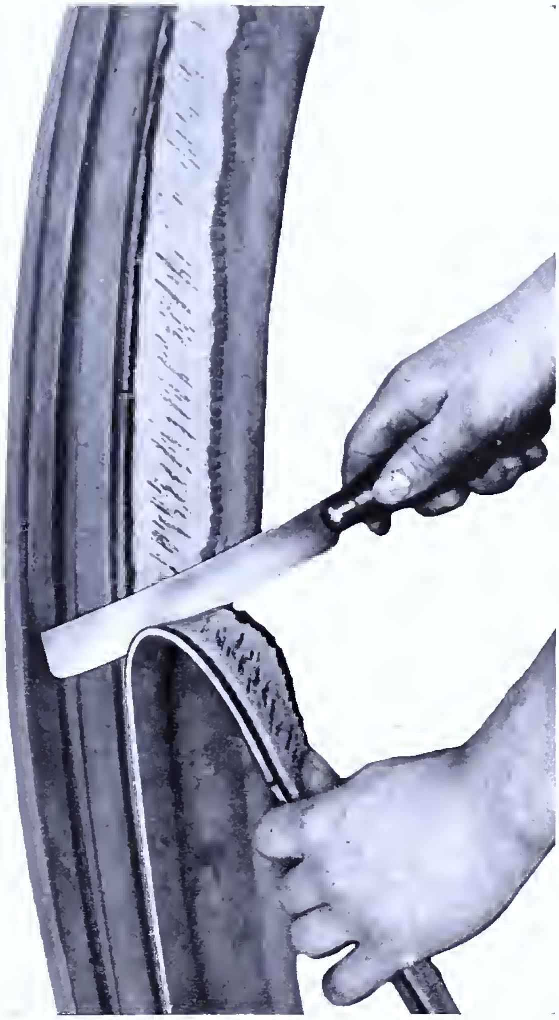

FIG. 6. HOW TO BEGIN STRIPPING THE TREAD

Drying:

The next step is to dry the tire thoroughly. The importance of this cannot be over-estimated. Moisture reaches the cords through injuries.

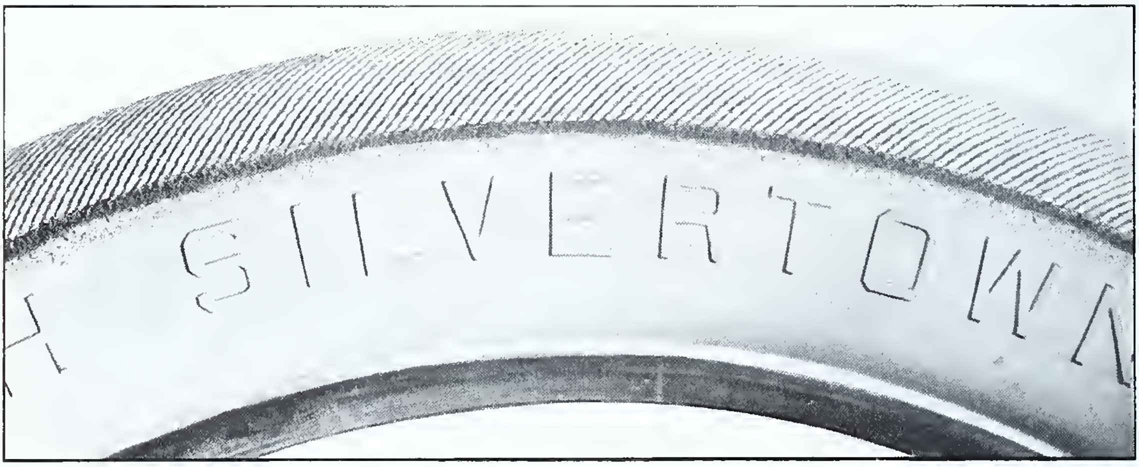

FIG. 7. CORD TIRE CUT DOWN AND BUFFED FOR RETREAD

Should the least trace of dampness remain, there is danger of cord separation, tread loosening and other harmful results. A small tight room or box, ventilated to discharge any moist air, heated to 150 degrees, dry heat, is just the thing for drying out cases. Every casing should remain in this heat about two hours. In the absence of either room or box, you will find that an inside vulcanizer answers nicely but not so efficiently; or, dry the case by placing it close to the vulcanizers where the heat will not exceed 150 degrees.

Building Up Retread

Cementing:

Apply three coats of No. 36157 vulcanizing cement, using for the first coat a thin solution, so that it will soak into the roughened cords; for the second and third coats use a medium heavy solution. The real object of these three coats is to bind the new tread to the cords. Dry each of the first two coats of cement for one hour and the third for from 6 to 12 hours. It is better, however, to allow the cemented tire to dry over night. Do not expose to a direct air draft or use a fan to hurry the drying process for the reason shown on Page 39. Cover the cemented cords with a sheet of No. 8300 cushion gum ($\frac{1}{32}''$ thick) down over the edge of the old sidewall as far as roughened. Roll this sheet down thoroughly and wash with gasoline. You are now ready to apply the tread band which should be prepared as follows:

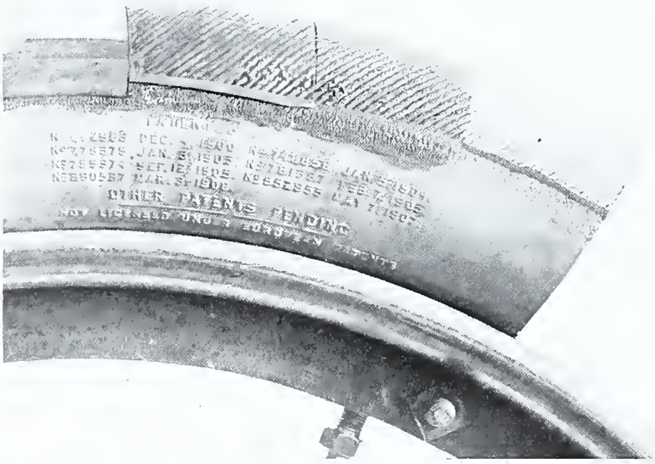

FIG. 8. CORRECT WAY OF BUILDING UP RETREAD

Treatment of Semi-Cured Retread Bands:

The inside surface of the semi-cured retread band should be buffed, to roughen it so as to present a surface into which the cement can penetrate. Apply a thin solution of No. 36157 cement. After this has dried for about an hour, apply a thicker solution of No. 36157 cement and let this dry about twelve hours, depending somewhat on weather conditions.

Our retread bands are made with breaker strips in them, as may be seen by referring to Figure 9.

Applying Semi-Cured Retread Bands:

Place a wide piece of clean muslin around the case to keep the band from sticking to the carcass. Slip the band over this and center it. A guide line drawn with dividers around each side of the case will aid wonderfully in this centering operation. Better still is to use dividers extending from the channel of the bead to the outer edge of each outside rib or the outside bars in the great safety design. Extreme care should be exercised in this because Ribbed or Safety Treads, if off center, will cause the wheel to appear to wobble while in motion, when, in reality, it does not. Pull the muslin carefully and gradually from under the retread band and roll the band down thoroughly all around.

Splicing Semi-Cured Retread Bands:

A 37 x 5″ semi-cured retread band will not fit a 35 x 5″ case. However, the band can be made to do so by cutting out a piece. (See Fig. 9.) When a piece is cut from a band in this manner the ends may be spliced either before the band is applied to the case or afterwards. By referring to the photograph, Figure 9, it will be noticed that the tread stock was cut through at an angle of about 45 degrees. Care must be taken that both

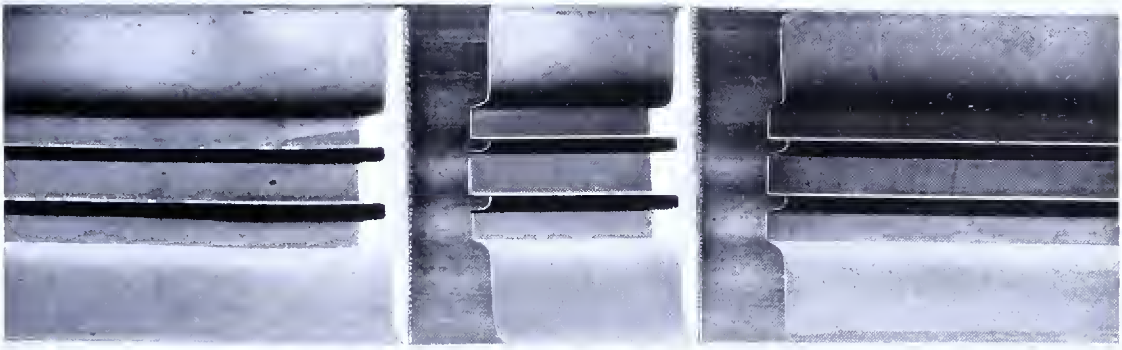

FIG. 9. BEVEL CUT AND SPLICING OF RETREAD BAND

incisions are made with the knife slanting in the same direction. The beveling of the ends increases the splicing surface. Rough up the ends; apply No 36157 cement; when dry, cover one end with a strip of No. 8100 tread gum. The ends may be brought together or they may be left free before applying. When the band has been spliced, it again becomes endless and is applied accordingly. If the ends are to be left free, apply the band without using muslin, and center as you work around the case. When the ends are finally brought together, stitch them and then roll down all around.

Equipment for Curing

A neat and durable retread should be the aim of every repairman, and in order to get this result, extreme care is absolutely necessary in mounting and wrapping retreaded Silvertown Cord Tires for the cure.

The repair work on the casing, or tearing down and building up, is now finished. The casing should look almost like a new one, but it is not yet ready for use. The new stock must be cured, to weld it to the carcass.

Pressure must be applied to rubber while being cured. **Without it, the work will be worthless.** This pressure is secured by one of four methods of mounting and wrapping the casing for the cure, in which some of the following supplies are used:

- Retreading Rims
- Rings and clamps
- Steel coils and pads
- Endless Air Bags
- Negative wrapping pads
- Soapstone mortar
- Long muslin strips
- Tread Jackets
- Pot Heater

While many repairmen know of these appliances, tools and supplies, and their uses, each one is illustrated and its use explained for the benefit of those who may not be fully posted.

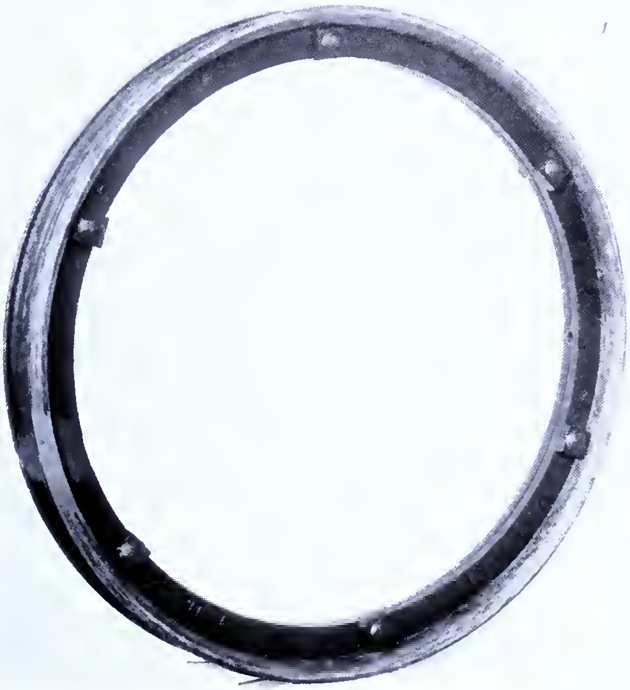

FIG. 10

Retreading Rims

These rims are similar to standard clincher rims, split in the middle. A substantial steel ring is securely riveted to each half of the rim and bolts are provided for clamping the two halves together.

Retreaded casings, with coils or endless air bags inside are mounted on these rims and the bolts tightened. This is done to hold the beads in shape, and stretch the casing tightly around the coil or the air bag.

Retreading rims are made in all the necessary sizes.

Steel Retreading Coils

The coils are made of the best flattened spring steel, galvanized to keep from rusting.

Aided by the rings, or rims, the coils hold the casing in shape so that the wrapper or tape can be drawn tightly to produce pressure.

The coils are made in different sizes—a 36 x 4 to fit a 36 x 4 casing, and so on.

The rings, rims, wrapper or tape, will be described farther on, and their uses explained.

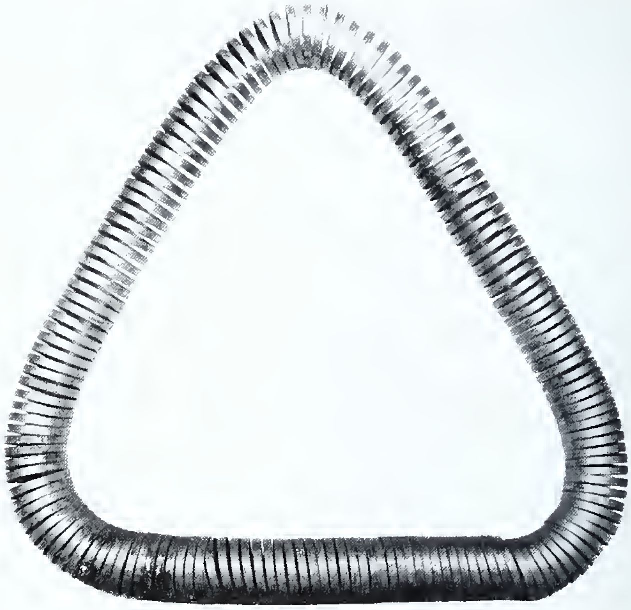

FIG. 11

Liner Pads

The inner cords of retreaded cases must not be injured. When steel retreading coils are used two-ply liner pads will keep the inner cords from being cut or damaged. The entire inner surface must be evenly covered. These two-ply liners are usually stripped from the carcasses of old fabric casings, or they may be made from new fabric.

Rings and Clamps

The rings and clamps, like the retreading rims, stretch the retreaded casing tightly around the coil or the air bag, and keep the beads in shape.

When mounted, the rings are held in place, as illustrated in Figure 12, by clamps, which are taken off one by one as the case is being wrapped.

These rings are similar to the retreading rim, but not as wide nor as heavy. Made in the clincher style, they curve around the heel

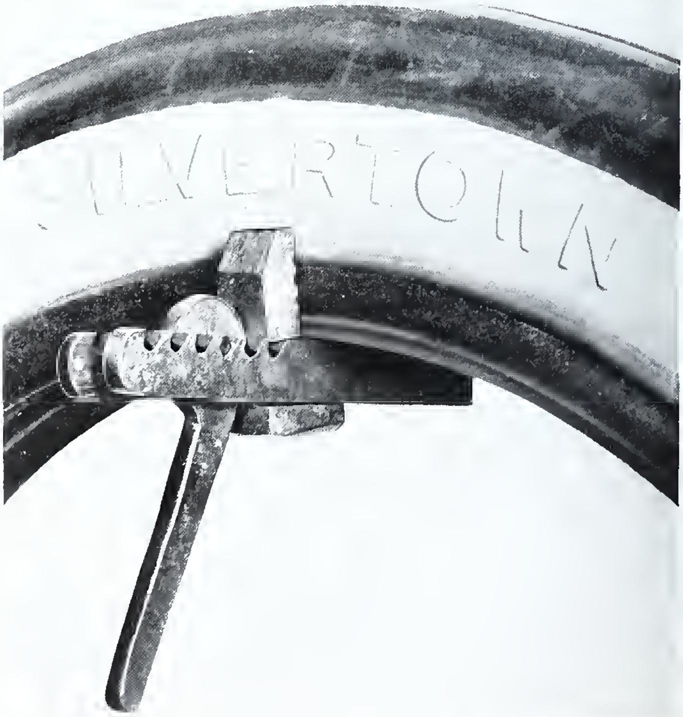

FIG. 12. HOW TO ADJUST CLAMPS ON RINGS

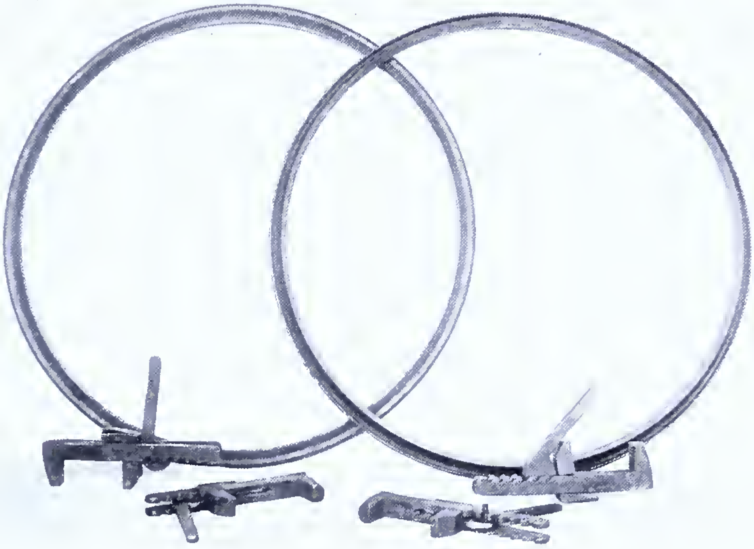

FIG. 13

of the bead, and completely cover it. They are made in all the different sizes with the exception of 32 x 3½, 36 x 4 and 36 x 5.

The straight bead ring is made to curve in just the opposite direction from the clincher and they fit the straight bead casing exactly.

Preserving Tread Form

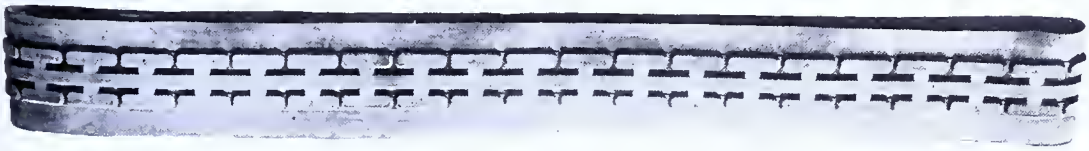

FIG. 14

To save the tread design during vulcanization there must be equal pressure on all points of the tread, namely—depressions and projections. Two methods are used to do this, viz.:

1. The negative wrapping pad for Ribbed Treads.
2. A thick mortar of soapstone and water for Safety Treads.

Their uses will be explained later.

FIG. 15

Negative Wrapping Pads

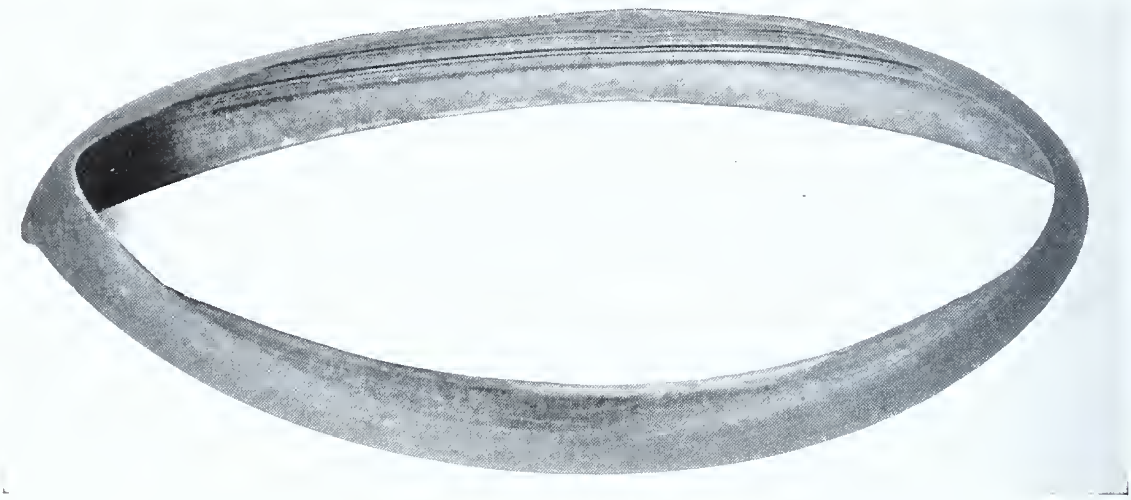

FIG. 16

Negative Endless Wrapping Pads are made of fabric and gum for Ribbed Tread casings only. They are similar in construction to the impression pads used in cavity vulcanizers for forming non-skid tread designs. The negative wrapping pad may be used either endless or cut. If endless, break the tire down and slip the pad into position. If cut, place in position. If the two ends do not meet, use soapstone mortar, as described below, to fill the gap.

These negative wrapping pads are made up endless in the following sizes:

32 x 3½ for all 3½-inch tires
36 x 4 for all 4 -inch tires
36 x 4½ for all 4½-inch tires
37 x 5 for all 5 -inch tires
38 x 5½ for all 5½-inch tires

In other sizes it will be necessary to cut out sections in order to make the pad fit any desired circumference.

For instance, for a 34 x 4 casing, cut a section from a 36 x 4 pad, and so on.

Mortar for Tread Designs

Make a thick mortar of powdered soapstone and water. With this, fill the depressions in the Tread design.

Spread evenly and smoothly so that there will be equal pressure on all parts of the tread, when wrapped.

Now cover the tread with a muslin jacket. This will hold the mortar in place, when the final wrapping is adjusted.

The result will be a very neat retread.

Wrapping and Curing

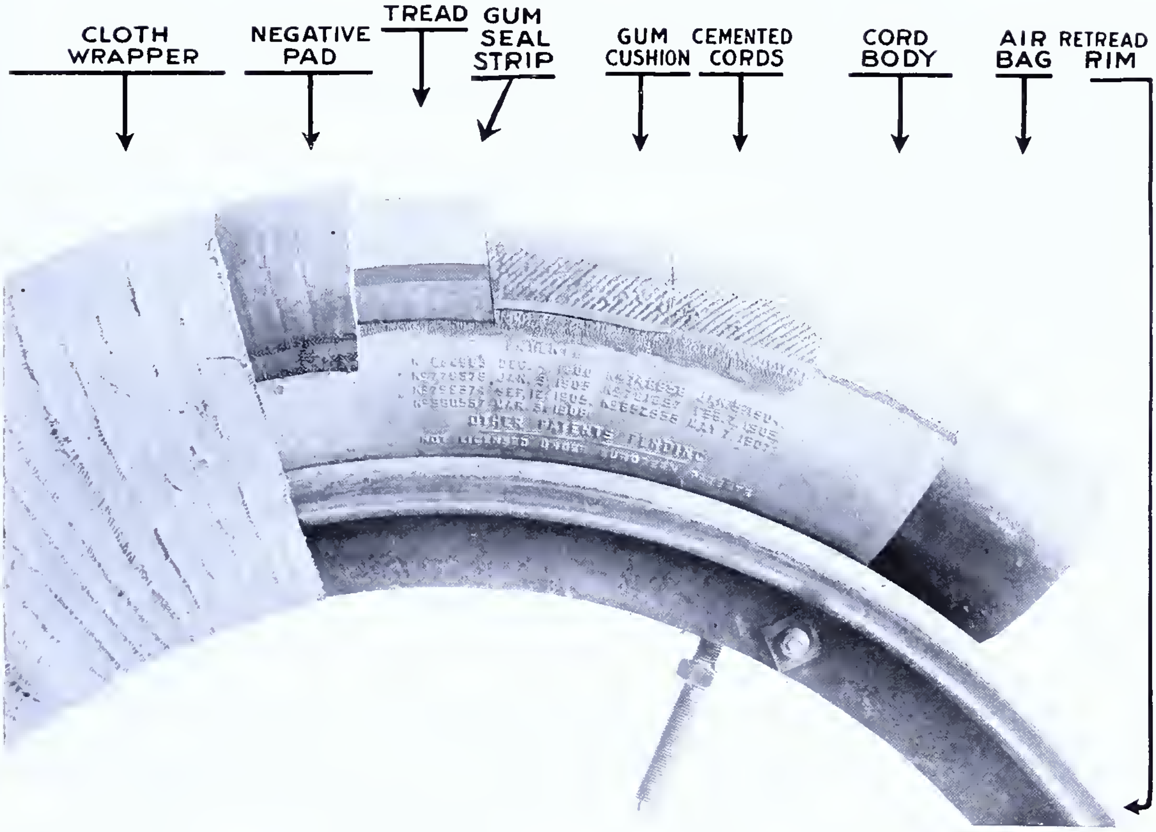

FIG. 17. CORRECT METHOD OF WRAPPING AND PREPARING RETREAD FOR CURING

Four Methods of Wrapping

Good pressure is absolutely necessary on the side-walls of Cord Tires, while being cured.

This may be obtained by any one of four methods, viz.:

1. With rims and air bags.
2. With rims and steel retreading coils.
3. With rings, clamps and air bag.
4. With rings, clamps and steel coils.

Each method is described in detail below.

Method No. 1. With Rims and Air Bags

1. Dust the case lightly with soapstone, inside and out.
2. Place the endless air bag inside the case.
3. Mount the case on the retreading rim and bolt securely.
4. Inflate the air bag with about 10 lbs. of air.
5. Adjust Negative Wrapping Pad or apply Mortar.
6. Wind tightly two layers of wet muslin strips 3″ wide completely around casing, rim and pad or mortar. (See Fig. 17.) Wind one layer from right to left, the other from left to right. Use about a 5/6 lap which will leave about one-half inch of the bottom wrapper exposed.

7. Inflate air bag to about 40 to 50 lbs. to give pressure on side-walls.
8. Cure in Pot heater.

NOTE.—The bolts remain in place until the cure is finished.

Method No. 2. With Rims and Steel Retreading Coil

1. Dust the case lightly with soapstone, inside and out.
2. Place a two-ply fabric liner inside the case to keep the inner surface from being damaged by the coil.
3. Place the steel retreading coil in the case, making sure there are no kinks and that the coil is opened up uniformly all around.
4. Mount and bolt the case securely on the rims.
5. Adjust Negative Wrapping Pad or fill with Mortar.
6. Wind two layers of muslin, as explained in the first method, but wrap very much tighter. Use all the strength you can, as there is no air pressure inside to tighten wrapping later.
7. Cut in Pot heater.

7. Cure in Pot heater.

Method No. 3. With Rings, Clamps and Air Bag

1. Dust the case with soapstone, inside and out.
2. Place the endless air bag inside the case.
3. Mount on the rings and fasten with the clamps as shown in Fig. 12.
4. Inflate with about 10 lbs. of air.
5. Adjust Negative Wrapping Pad or fill with Mortar.
6. Wind two layers of wet muslin strips, as in Method No. 1, removing each clamp as you come to it in working around the case.
7. Inflate to about 40 to 50 lbs.
8. Cure in Pot heater.

Method No. 4. With Rings, Clamps and Steel Coil

1. Dust the case lightly with soapstone, inside and out.
2. Place the fabric liner inside, as in Method 2.
3. Insert the Steel Coil, as explained in Method 2.
4. Mount the rings and adjust clamps, as in Method 3.
5. Adjust Negative Wrapping Pad or fill with Mortar.
6. Wind tightly two layers of wet muslin strips, as explained in Method 2.
7. Cure in Pot heater.

Curing in Pot Heater

Allow 5 minutes to raise the steam pressure to 20 pounds;
40 minutes to raise from 40 to 45 pounds; and hold at 45 pounds for 30 minutes.

Repairing Silvertown Cord Casings

Quite often the tread rubber on Silvertown Cord Casings is cut down to the cords without damaging them. Such cuts must be repaired quickly or moisture and dirt will work through into the carcass. Any dirt, grit or moisture, in fact, anything that does not belong in the make-up of a first-class casing, will begin to damage the cords as soon as it reaches them, just as sand will damage gears. The damage will spread until the cause (dirt, grit or moisture) is removed and the cut repaired. The longer the delay, the larger the repair.

This section of the Repair Book, then, will tell how to repair cuts by using

Tread Patches and Tread Sections

First—pry into the cut with an awl to see how much damage has been done. If the tread has not been loosened nor the cords damaged, scratch a line on the tread about three-quarters of an inch from each side and end of the cut. If the tread has been loosened around the cut, scratch a line on the tread about one-half to three-quarters of an inch beyond each end of the loosened portion. If the cords have been damaged, a different plan must be used. (See Sections on How to Replace Cord Sections.)

Removing the Rubber:

Cut the tread along these lines through the breaker strip just to the cords. With a pair of pliers take hold of one corner of the rubber to be taken out and pull back, scratching at the cords with the awl until the rubber lets go. This will expose the cords. The next step is

Cleaning and Roughing:

When the patch is large enough, say four or more inches, as shown at bottom in Fig. 18, use a power-driven Buffing Brush. For smaller patches, one of which is shown at bottom in Fig. 18, the cleaning and buffing must be done by hand. A piece of wood cut to a blunt point is the best scraper. We use a piece of broom handle about six inches long, because it is already rounded, it is hard wood and is easy to get. Sharpen one end, beginning about three-quarters of an inch back. With this, scrape the surplus rub-

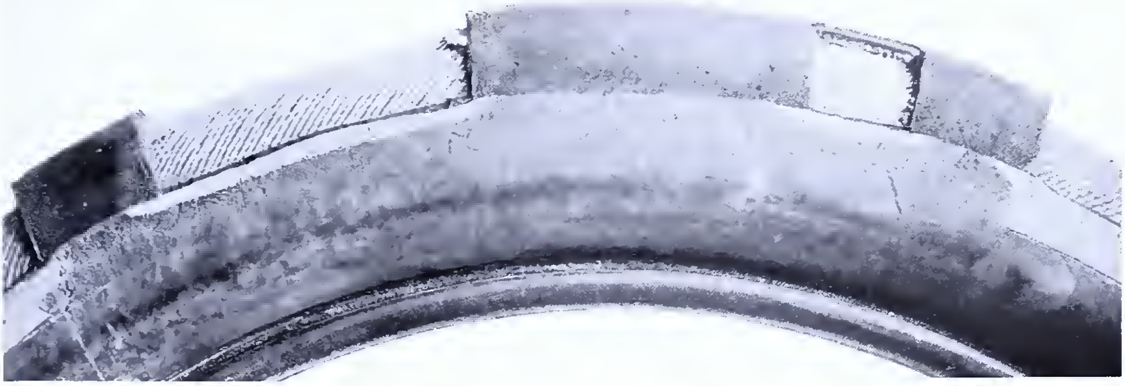

FIG. 18. READY FOR TREAD SECTION OR PATCH

ber from the cords. Be careful to clean the corners and edges. Then roughen the cords and rubber with a rasp so the cement will stick. Now clean the cords thoroughly with a stiff bristle brush to remove all loose rubber and cotton. After the case has been dried, as recommended on Page 7, it will be ready for building up.

Building Up:

Apply a medium heavy coat of Number 36157 cement and dry for one hour. Then apply the second coat, drying from six to twelve hours. Next cover the cords with one ply of No. 8300 cushion gum, $\frac{1}{32}''$ thick.

Fit in the breaker strips. Next cover the edges of the rubber which border on the exposed cords with narrow strips of No. 8300 cushion gum. This will keep the cement from peeling off while stitching the tread stock into place, and will weld the new gum to the old. Apply impression pad over the new gum (see Page 41), and place in cavity vulcanizer.

Cure:

One and one-half hours at 60 lbs. steam pressure in cavity vulcanizer.

How to Make Impression Pads:

Impression pads may be made by laying one ply of fabric over a case of the tread design wanted, the depressions filled with raw gum, a second ply of fabric laid over this and cured in a cavity vulcanizer for about one-half hour.

How to Replace Cord Sections in Clincher Cases

When a new cord section is to replace a certain part of the outer cords, *i. e.*, those next to the tread, which may have been cut or injured, proceed as follows:

Locate the injury on the tread. If the damage to the tread has left a large cut, prepare the tire for a tread patch as has already been described in one of the preceding chapters (Page 17).

If, however, the cut on the tread is small, *i. e.*, remains closed of its own accord, the tread rubber does not need to be removed. In this instance the cut can be cleaned thoroughly and the edges roughed up with a file. This operation, however, should be left until after the injured cords have been removed, but before the new cord section is put in. By handling the tread in this way it is more flexible and easier to work. The cement for the tread patch should be applied at the time of the cementing operation for the inside of the tire, described later in this chapter.

When Outer Cords are Injured

Having prepared the injury on the tread as described, turn the tire inside out. Where cords in the outer ply *only* are injured, it will be nec-

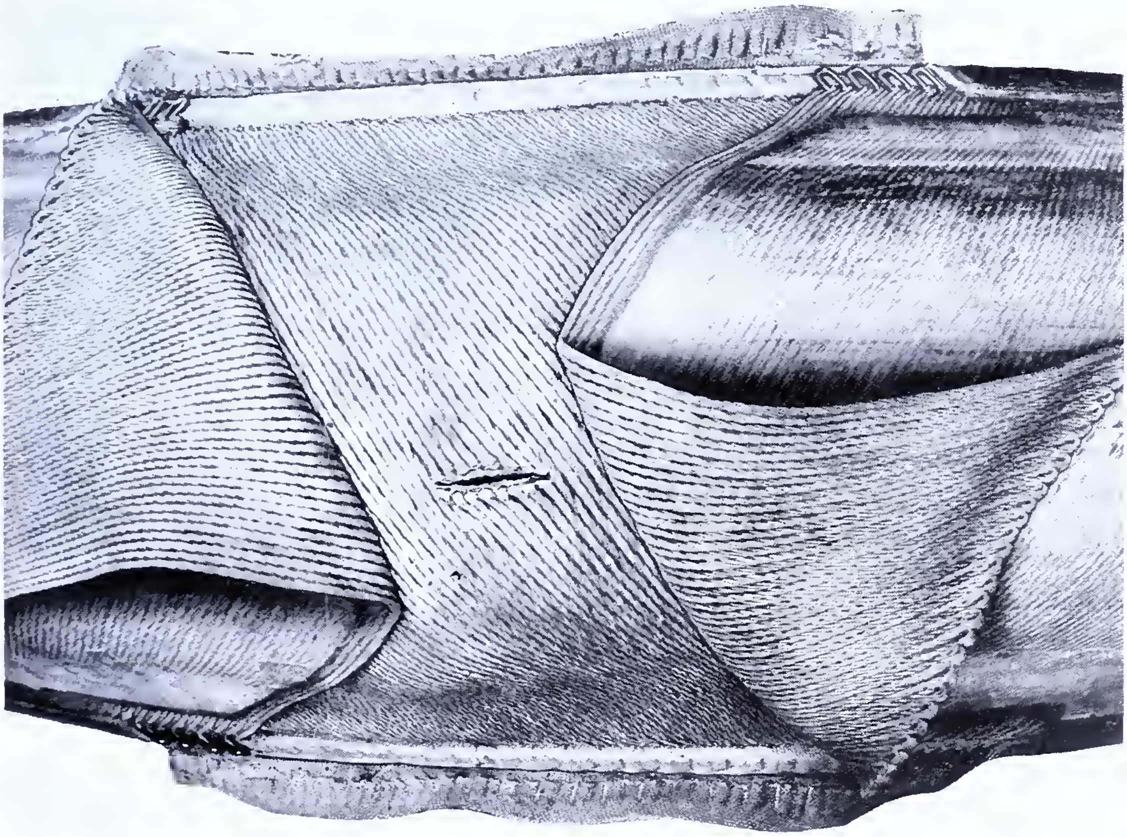

FIG. 19. INNER CORDS LAID BACK SHOWING INJURED OUTER PLY

essary to lay the inner ply back on each side, as shown in Figure 19. 19. As the outer cords run crosswise to the inner cords, quite a portion of the inner ply will have to be separated from the outer ply. Yet no more should be separated than is absolutely necessary.

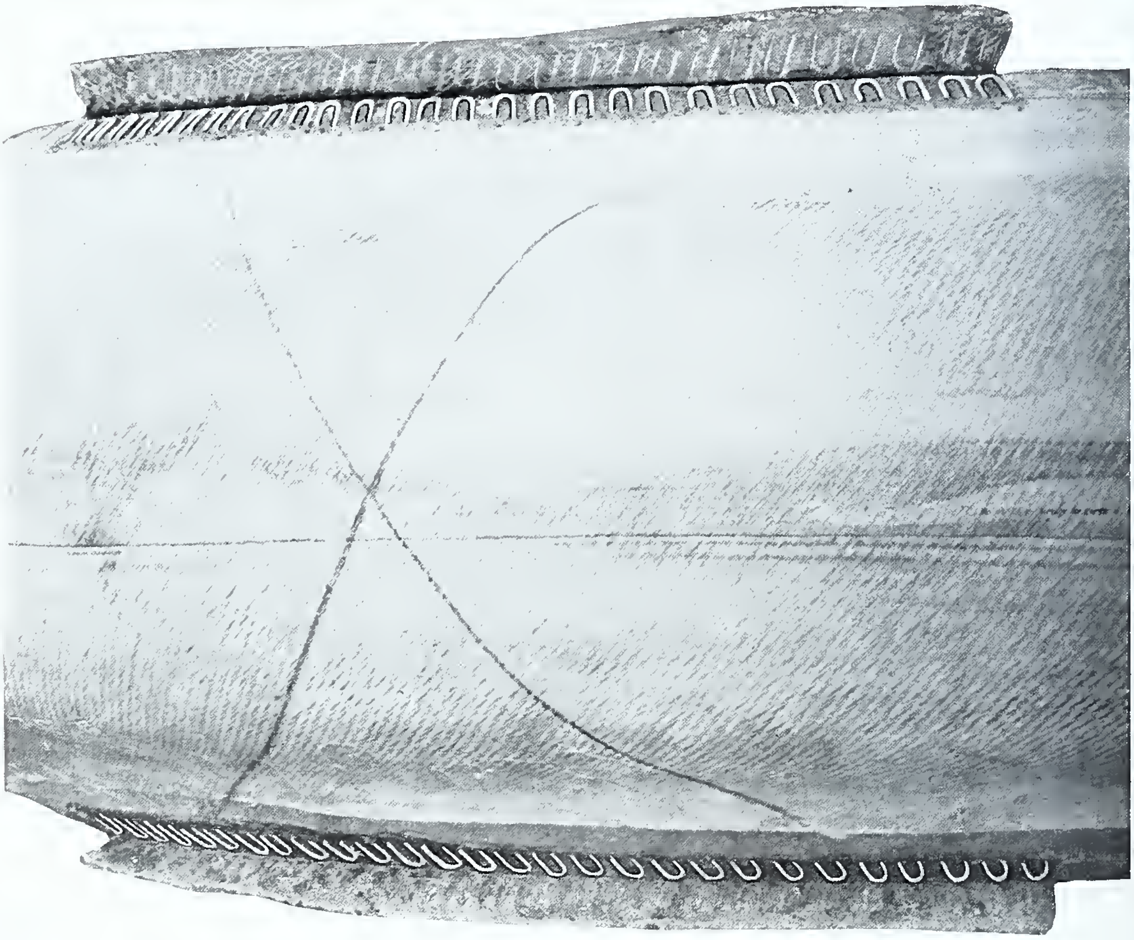

FIG. 20. SHOWING LINES ON CORDS AND BEAD COVER LAID BACK

To lay these cords back, first locate the point of the cut from the inside of the tire. Draw a line with a pencil from bead to bead through the known point of damage, following the direction of the inner ply of cords. Now draw a line through this same point, following the direction of the outer ply of cords, from bead to bead (Figure 20). Both these lines may be drawn with a pencil at first but practice will enable a repairman to determine them by eye. The ends of these lines crossing each other at the place of injury will determine two points on each bead. Now loosen the inside bead cover on each bead of the tire with an

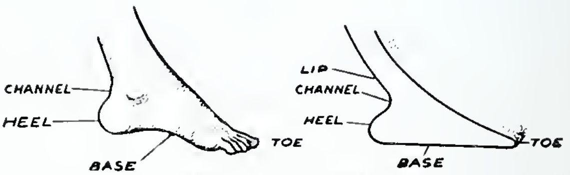

FIG. 21. SHOWING DIFFERENT BEAD PARTS

awl. Two inches beyond each point on the beads, cut the inside bead cover as far as the toe of the bead. Lay back this strip of inside bead cover between the two cuts in each bead cover as far as the toe of the bead. This will expose the staples to which the cords are fastened in the bead. Take out all the staples except those in the four 2″ margins beyond the ends of your intersecting lines.

Now you are ready to lay back the inner cords as in the Figure 19. First run your awl deeply between the cords along the line drawn in the direction of the inner cords, *i. e.*, those cords farthest from the tread. Cut the loop at one end of this line to permit the cords to be folded back. Now loosen the *looped edges* from the lower ply, and strip back the cords about half way across in opposite directions along this drawn line. This will make two flaps of cords folded back in almost triangular shape. Fasten them back as illustrated.

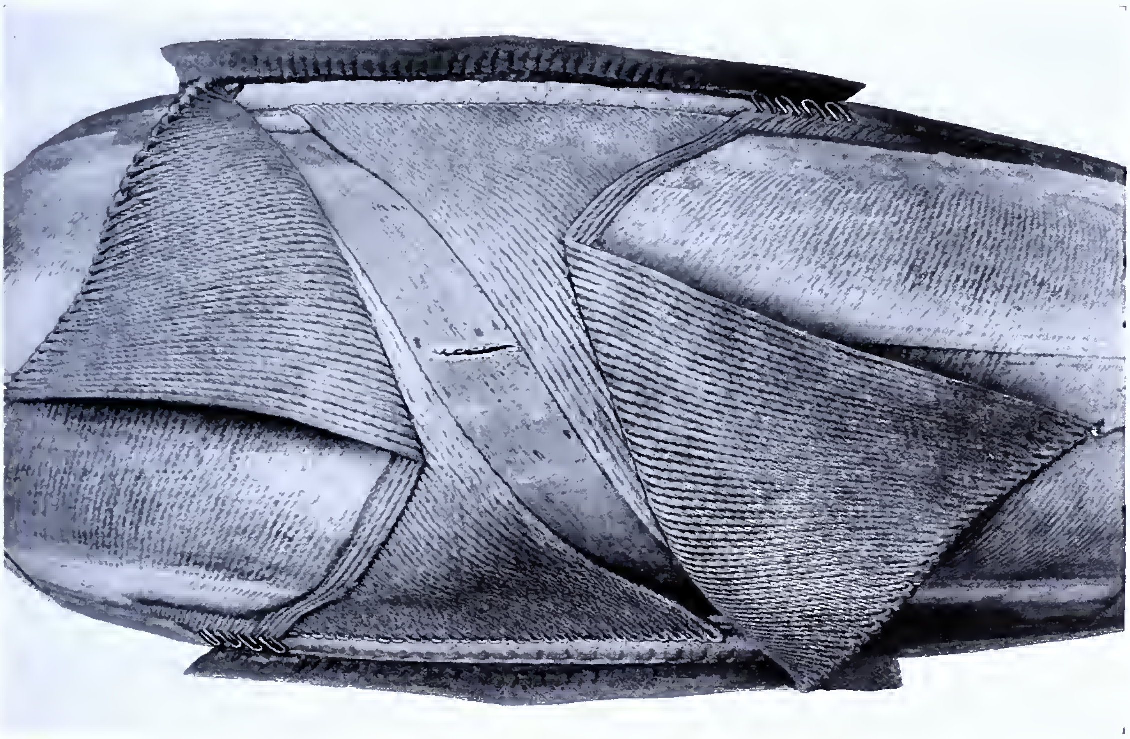

FIG. 22. STAPLES AND INJURED CORDS REMOVED

Removing Injured Cords:

The injured cords of the layer next to the tread are now exposed. Although only three or four cords may be injured, it is advisable to remove at least eight in order to insure abundant room for working and giving greatest strength to the repaired part.

Having decided upon the cords to be removed from the outer ply, pick up one end of the injured cord with an awl and grasp it with a pair of pliers. Unfold it cord by cord until a sufficient number of cords have been removed. It will be necessary to pick up the other end and unfold that, cord by cord, in the opposite direction until not less than eight cords have been removed. (Fig. 22.) If the injury affects more than eight cords, of course, a sufficient number will be taken out to enable you to replace all damaged cords. This done, buff all exposed portions which will include the following: (1) the exposed side of the ply which is folded back; and (2) the exposed side of the ply next to the tread. Buff very carefully and lightly the entire channel made by the removal of the damaged cords.

Replacing Cord Section:

Now secure a cord section from cord section stock, this stock to be taken from a casing of the same cross-sectional diameter as the tire undergoing repairs, and having the same number of cords in it as the section removed. This cord section should be treated as described on Page 36. The case may now be turned right side out. At this time it will be a good plan to fit (not fasten) the new cord section to be absolutely sure that it will exactly replace the damaged one removed. Having done this, place the tire and the new section in the drier or put it through whatever drying process you may have.

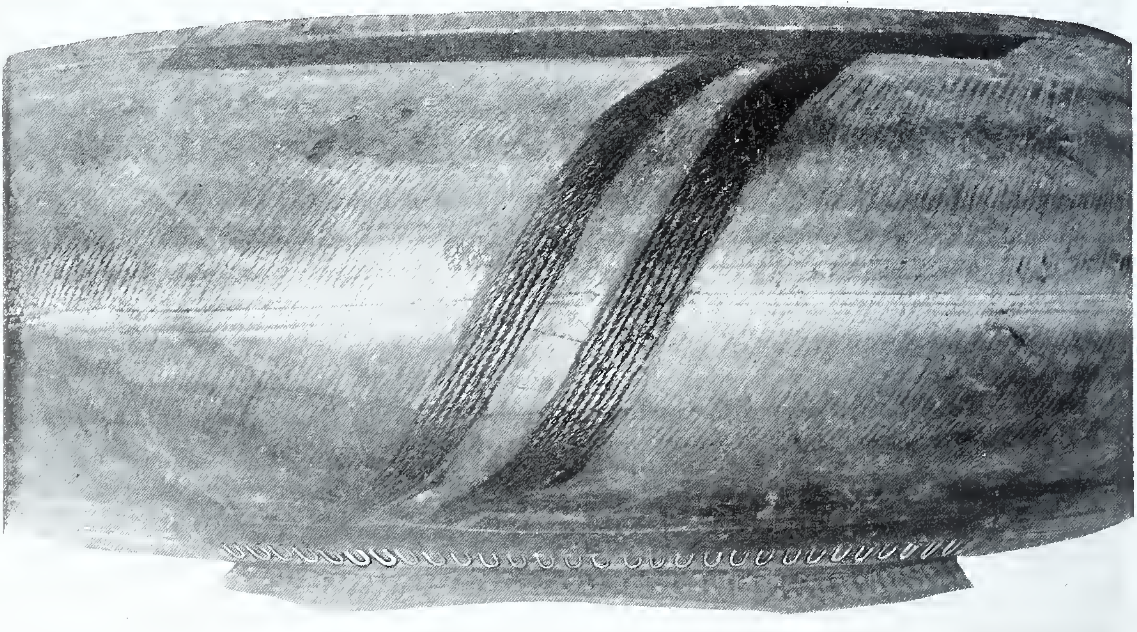

FIG. 23. HOW REPLACED CORDS ARE SEALED WITH GUM STRIP

After drying and just before cementing, turn the tire inside out again. Apply two medium coats of No. 36157 cement to all exposed portions as were enumerated for buffing. Allow the first coat to dry not less than an hour; the second not less than six hours. On the new cord section lay a strip of No. 8300 cushion gum $\frac{1}{64}''$ thick, this gum to lie next to the sidewalls and the tread when the new section is in place. With this same cushion gum, also cover the exposed cords which have been laid back and cemented. Turn the tire right side out for the second time. Lay in the new cord section, beginning at either end and stitching it down thoroughly.

Now lay the "flaps" or lifted inner ply of cords back in place and insert the staples. The inner ply can now be rolled and stitched. Before replacing the bead covers lay a strip of No. 8300 cushion gum $\frac{1}{64}$" thick over the cemented cords so that it will extend not more than ¼" above the bead strip when back in place. Seal the line where the inner cords were divided, with a strip of the same cushion gum. (Fig. 23.)

Proceed to replace any tread rubber which may have been removed, the same as has already been described. (Page 17.) If no rubber has been removed, fill the cut with No. 8100 tread stock.

Curing:

To cure, first place in the Cavity Vulcanizer with impression pad and Air Bag. Cure one hour and thirty minutes at 60 lbs. steam, then remove and finish curing on an inside vulcanizer forty-five minutes at 60 lbs. steam.

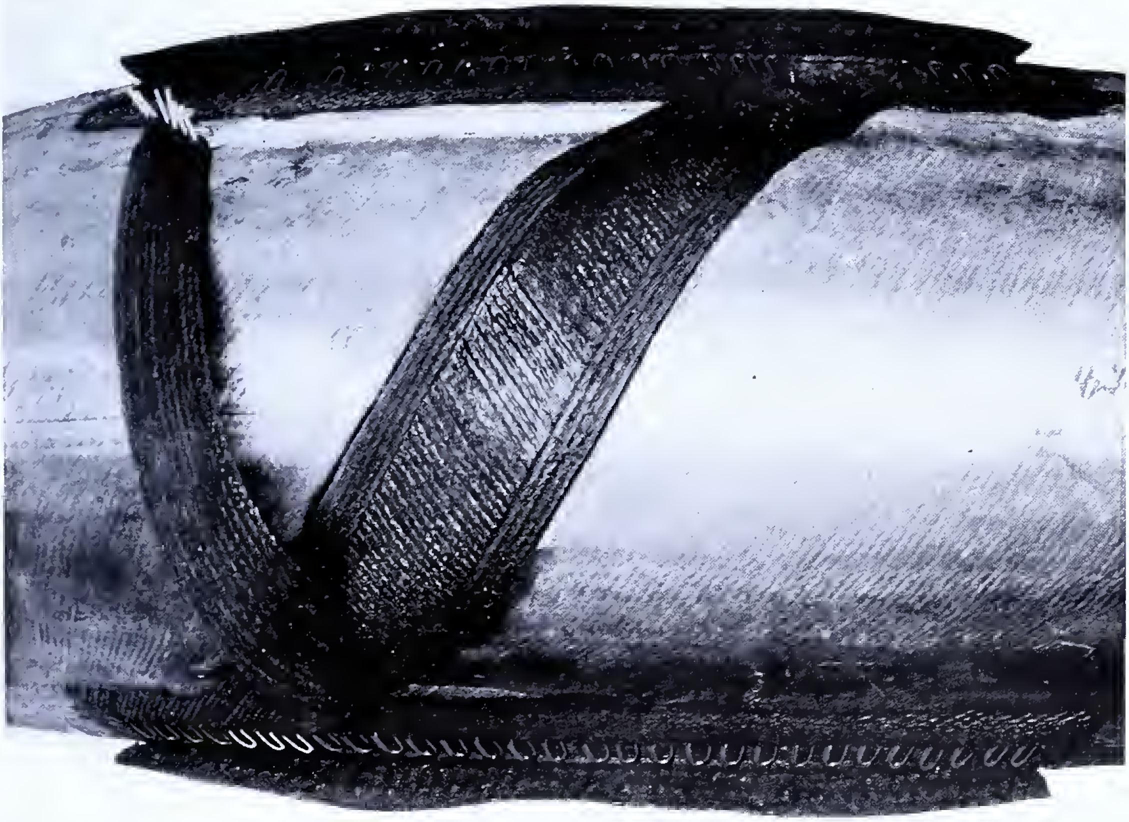

FIG. 24. OUTER CORD REPLACED AND NEW INNER CORDS READY

When Both Cords are Injured:

When cords in both inner and outer plies are injured, and must be replaced, the same method is pursued as in the previous case—except that injured cords from the inner ply, which is to be folded back, must also be replaced. This is done after the flaps, less the removed cords, are cemented down and in the same manner as the outer cords. (Fig. 24.)

When Only Inner Cords are Injured:

This process is much simpler than the preceding ones. It is necessary to loosen only enough of the inside bead cover to permit necessary cords to be replaced as on other occasions.

How to Replace Cord Sections in Straight Bead Cases

Having located the injury and having found the extent of the injured cords, take a cord section from an old tire of the same size and lay over the tread, with the ends at the beads, to obtain the angle at which the outer cords are laid in the case.

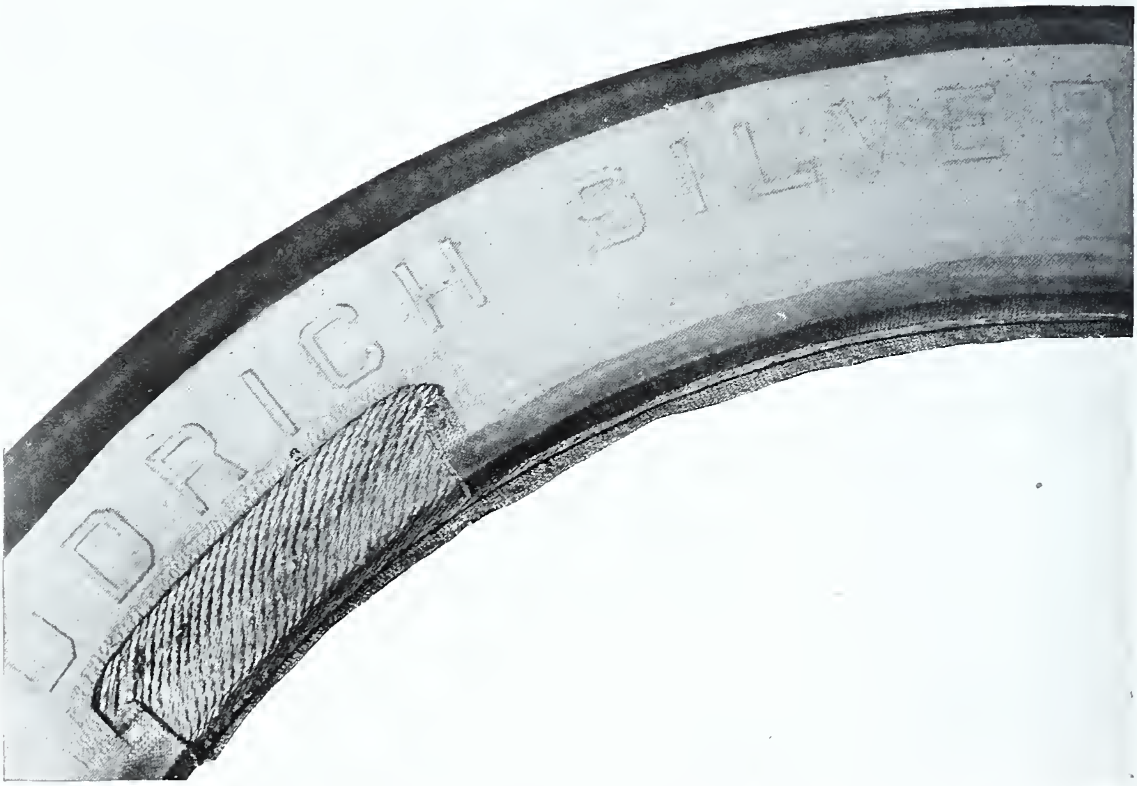

FIG. 25. BEAD COVER LAID BACK AND SIDE WALL REMOVED TO RELEASE CORDS

Should it be necessary to remove six or more cords, take out a piece of the outside bead cover of each bead about 1¼ inch up the side wall so that the cords will be exposed about an inch *each side* of the section you intend to remove. (See Fig. 25.) While it is not absolutely necessary that the outside exposed cords be buffed and cleaned at this time, it is a good plan to do so before turning the tire inside out; still this operation may be left until later.

Now turn the case inside out and get a line of the inside cords extending thru the point of injury, which will cross the outside cords at right angles. This line will meet the beads at points almost directly opposite the ends of the line on the outside cords. (Same as with Clincher Cases, Fig. 20.) Mark these points as they will determine the length of the cord section involved in the work. Now take a knife and cut along the mold seam running thru the base of the bead: *i. e.*, that part of the bead which comes in contact with the rim. (Fig. 25.) In making this cut too much care cannot be used to keep from cutting the cords. This cut should extend between the two points determined on each bead by the lines just mentioned above. Cut thru the inside bead cover about an inch beyond these points on the beads, and loosen the bead covers in from where they have been cut, towards the toe or inside of the bead. (See Fig. 25.)

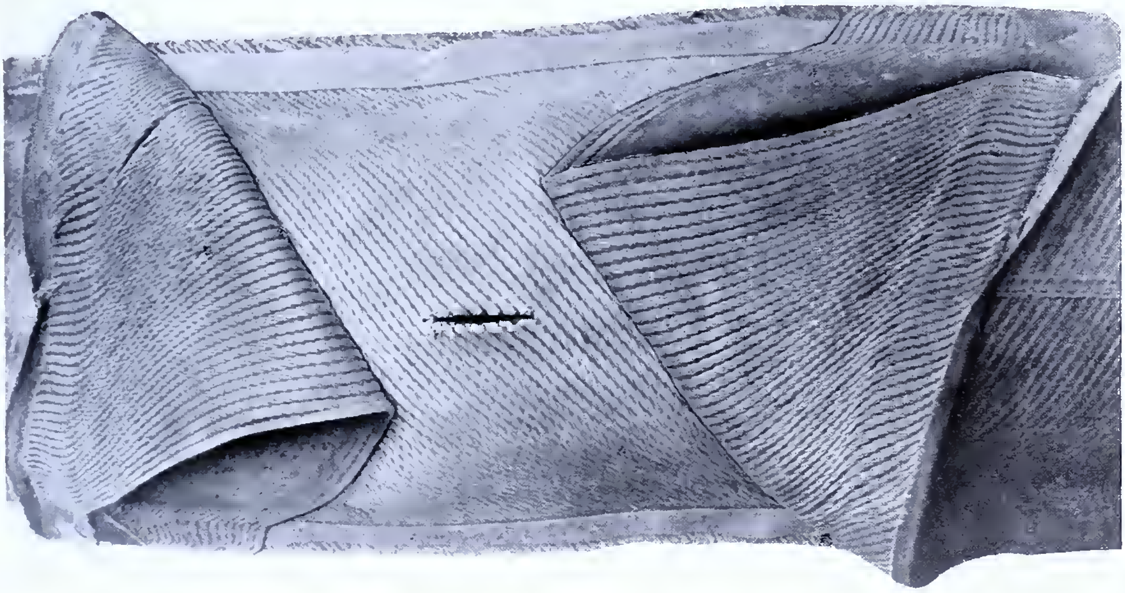

FIG. 26. HOW INJURED CORDS ARE LAID BARE IN STRAIGHT BEAD CASES

Now take the line on the inside cords passing directly over the injury. Begin to loosen the inside cords from the bead at one end of the line. Do this with an awl. Carry this loosening process along the bead to the point on the same bead marking the end of the outer cord line. This leaves the inner ply loose about one inch back. Now start to loosen the inner ply of cords beyond the bead from the outer ply, beginning at one of the points on the bead which was marked for the purpose at the outset. Carry this loosening or separating process along until a point has been reached about an inch beyond the last injured cord. This lays back the flap of inner cords. (See Fig. 26.) Under no circumstances loosen the inside bead strip from the inner cords. By allowing it to remain as is shown in the illustration, the inner ply of cords laid back, will be held securely together in their original position.

Repeat the process just described on the opposite side of tire.

Removing Injured Outside Cords:

Loosen the injured cords at the injury with an awl. Pick up one cord at a time and pull it loose from the tread side. You will remember having removed the outside bead cover, exposing a small portion of the outside ply of cords which goes over the bead, as shown in Figure 25. This makes it possible to pass the injured cords down under the bead to remove them entirely. Remove the cords one at a time until a section not less than six cords wide for the smallest injury has been taken out. (Fig. 27.) The buffing, drying and cementing processes are the same as those described in the instructions for cord sections in Clincher type cases, with this exception—in buffing, extreme care should be taken not to remove any rubber between the cords, consequently the buffing process on Straight Bead tires cannot be quite as thorough as on the Clincher type. Also, when selecting cord sections to take the place of the cords removed, these sections should be taken from cases of the same dimensions; that is, take the cords from 34 x 4½ case to put into 34 x 4½ cases being repaired. Cords from 35 x 4½ cases will not do. This holds good on all other sizes.

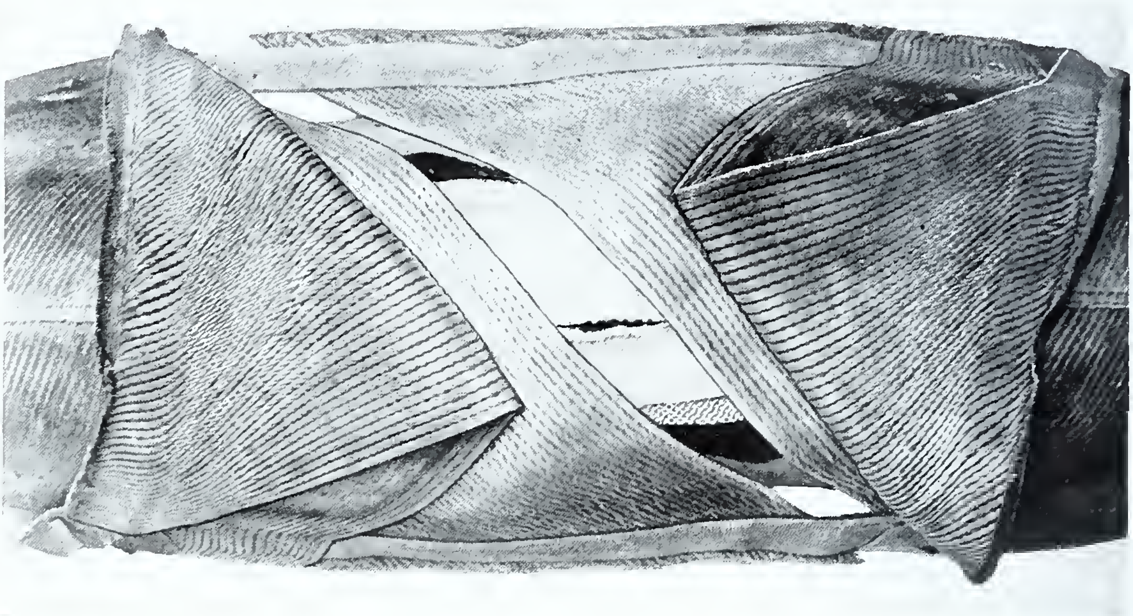

FIG. 27. WITH INJURED CORDS REMOVED

The injury on the tread is treated the same as a tread patch or small cut, which was explained under the Repairing of Clincher Cases, Page 17.

In putting new cords in place the process is virtually the same as in Clincher cases. Remember all cemented cords must be covered with No. 8300 cushion gum.
ion gum.

How the Goodrich H. D. 4-Ply Straight Bead Cord Tire is Repaired

The tread and side-walls are removed the same as in preparing the two-ply Silvertown Cord tire for outside and inside cord sections. The bead covers, however, are treated differently. By inspecting Fig. 28 you will notice that where the inner cords are removed, the bead cover is laid back from the inside of the tire to the toe of the bead. Where the outside cords are taken out, the bead cover is removed entirely to a point half-way between the toe and heel of the bead. The remaining portion is then laid back to the toe. The outermost and innermost plies of cords should be removed from bead to bead. This will leave the two intermediate plies undisturbed. Not less than eight cords each should be removed from the outside and inside plies, while but three or four cords may be injured. The inner plies should be skived to a featheredge at the point of injury. (See Fig. 28.) After having buffed and dried the tire, apply two coats of cement. When these are dry, stitch cushion gum into the place where the intermediate cords have been skived out, *to fill the hole flush with the cords.* Now cover the bottom of the channel made by the removal of the outer cords, with No. 8300 cushion gum ($\frac{1}{64}$" thick), carrying it from the toe of one bead to the toe of the other, butting the adjacent cords. Next lay a strip of No. 7430 fabric over the No. 8300 cushion gum in the channel made by the removal of the cords. The strip should be just wide enough to butt the adjacent cords and should extend around the bead to the toe. Roll down carefully and apply a second ply of No. 7430 fabric in exactly the

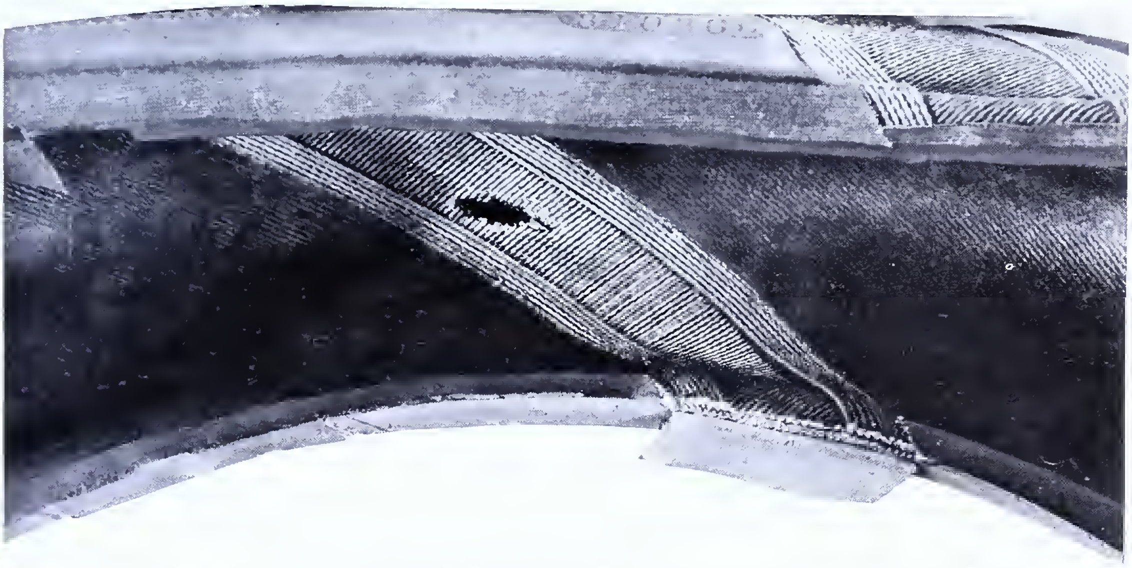

FIG. 28. SHOWING OUTERMOST AND INNERMOST CORD LAYERS REMOVED AND BEAD COVERS LAID BACK

same manner. Now apply a wider strip of No. 7430 fabric, carrying it from the toe of one bead to the toe of the other and overlapping three or four cords on each side of the channel. Over this lay a strip of No. 8300 cushion gum $\frac{1}{32}$″ thick so that it butts the rubber of the side-walls and tread. Apply the new bead cover so that it passes around the heel of the bead across the base and to the toe. (See Fig. 30.) The remaining portion of the original bead cover which has been laid back is now brought over the toe on to the new bead cover and rolled down. (See Fig. 30.) No. 7430 fabric is used to fill the channel made by the removal of the inner cords, in the same way, two plies butting the adjacent cords and one overlapping all plies, ending at the toe of the bead, Fig. 30, after which No. 8300 cushion gum is to cover the last ply and the original bead cover laid back on the inside. The side-walls and tread may now be filled in with No. 8200 and No. 8100 respectively, after which the tire is ready for curing.

Cure 1 hour and 40 minutes in Cavity Vulcanizer and 45 minutes on Inside Vulcanizer at 60 pounds steam pressure.

NOTE.—No. 7430 fabric is not cut on the bias—it is cut straight. To cut this fabric quickly and accurately, lay the stock on the table and draw the point of a sharp awl between the larger threads.

When cords in the outer plies, only, are injured, no repair work on the inside of the case is necessary, but the outer cords should be replaced with No. 7430 fabric, as we have described.

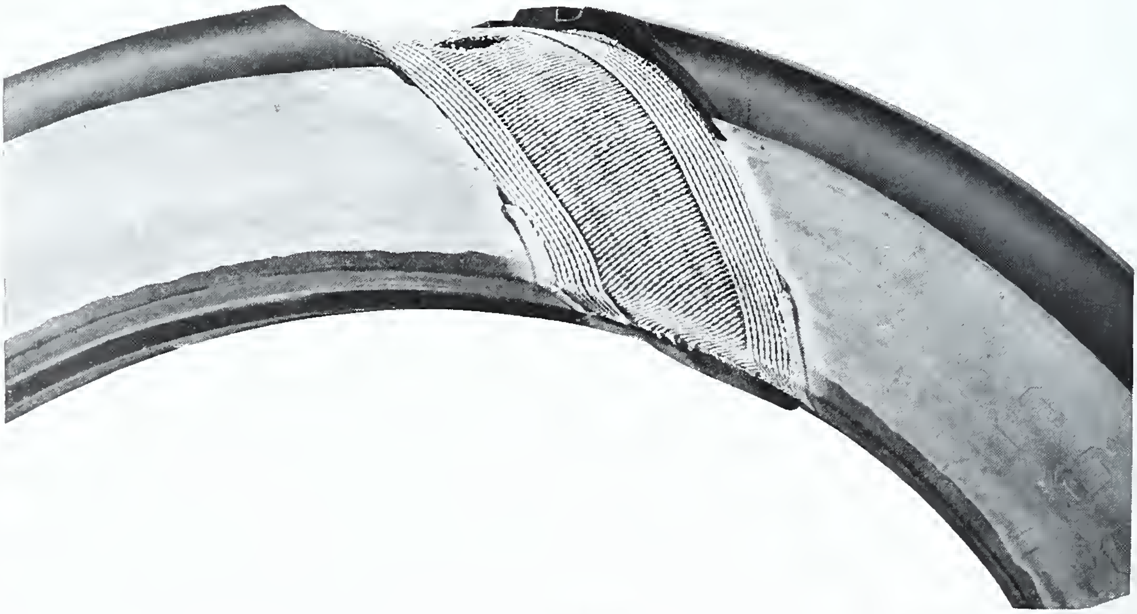

FIG. 29. SHOWING HOW INJURY TO THE INTERMEDIATE PLIES APPEARS WHEN SKIVED

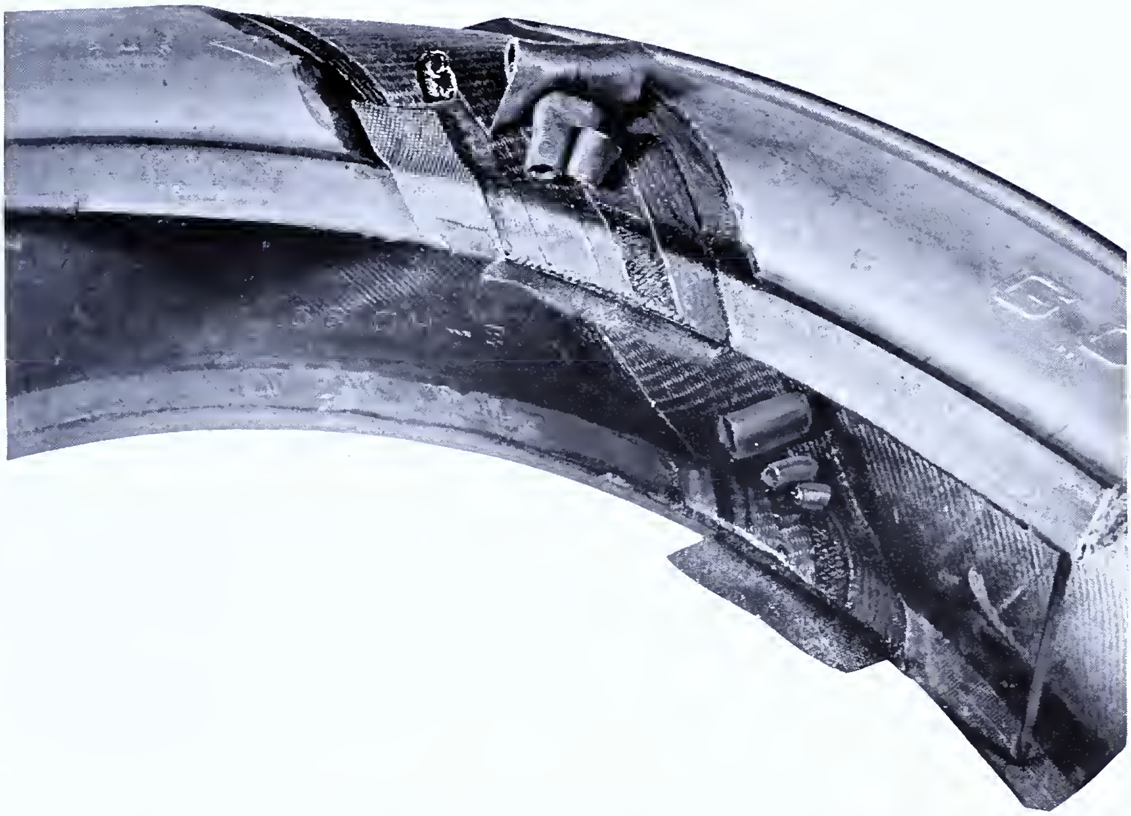

FIG. 30. ILLUSTRATING HOW No. 7430 FABRIC IS USED TO FILL THE SPACE FROM WHICH OUTER AND INNER CORDS WERE TAKEN WITH SECTION OF EACH PLY ROLLED BACK

How the Goodrich Airplane Cord Tire is Repaired

The carcass of the Goodrich Airplane Cord tire is made up of two plies of cords. These cords are the same size as those used in the H. D. Four-ply Cord tire described in the foregoing. There is no breaker strip in the tread and the tread is considerably lighter than on the type intended for road use. Ordinarily injuries to Airplane tires are easily repaired and the following method is recommended:

Figure 31 shows a tire that has been jabbed through at the hinge. Figs. 32 and 33 show the same tire with the injured cords removed from the outside and inside.

After drying and cementing, the section is then built up as follows: Lay a strip of No. 8300 cushion gum $\frac{1}{64}''$ thick in the space made vacant by the removal of the outer cords, and butting the adjacent outer cords. Next lay a strip of No. 7430 fabric the same width as the space over the cushion gum around the bead to the toe. Lay another strip in the same manner. Over these lay a wider strip of fabric from the *channel* of one bead to the *channel* of the other. This strip should overlap the filled-in portion to the extent of two or three exposed outer cords on each side. (See Fig. 34.) Strips of No. 7430 fabric are applied to the inside in the same manner and each one is

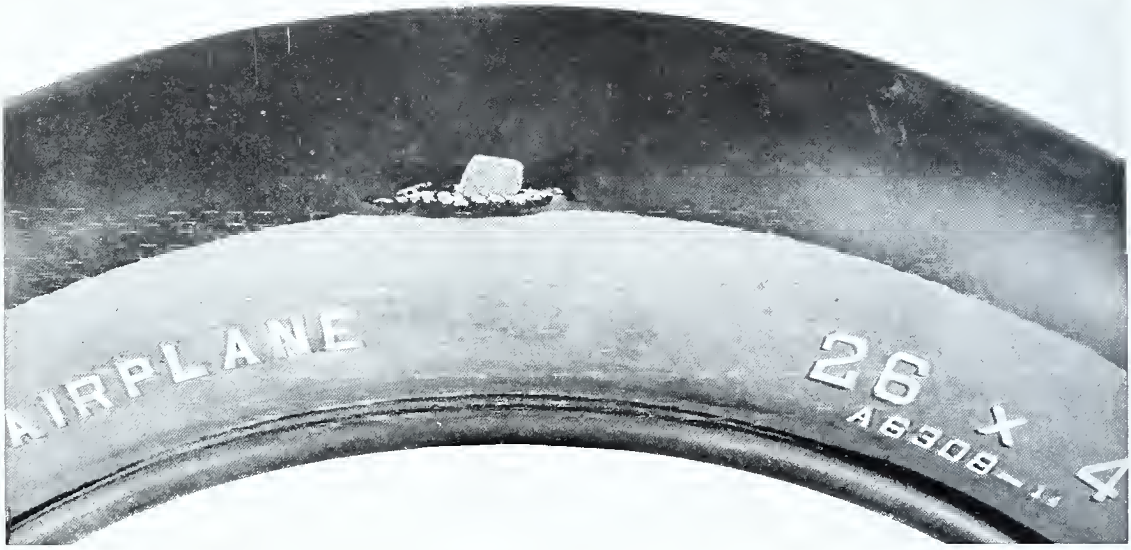

FIG. 31. EXTERIOR VIEW OF INJURY BETWEEN TREAD AND SIDE-WALL

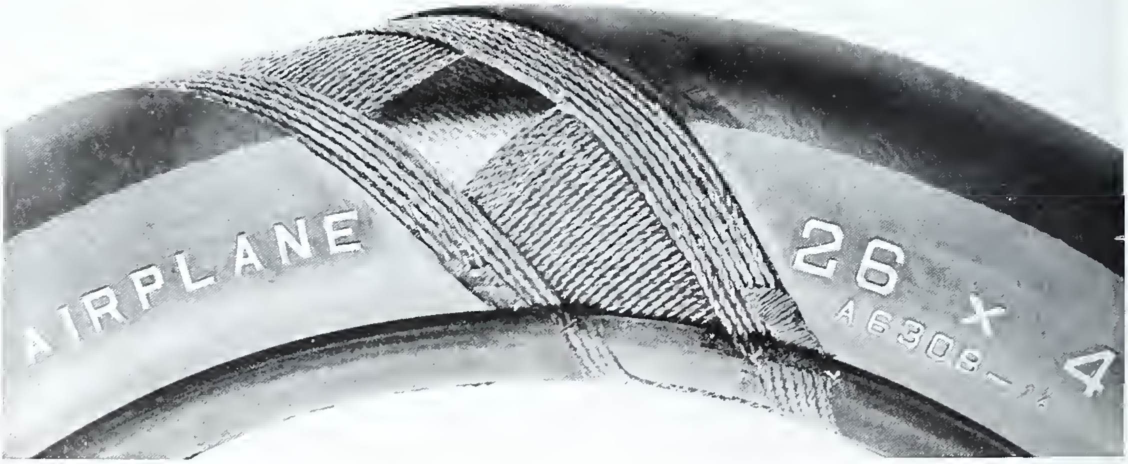

FIG. 32. EXTERIOR VIEW WITH OUTER AND INNER CORDS REMOVED

Note how bead strip and fabric have been cut away

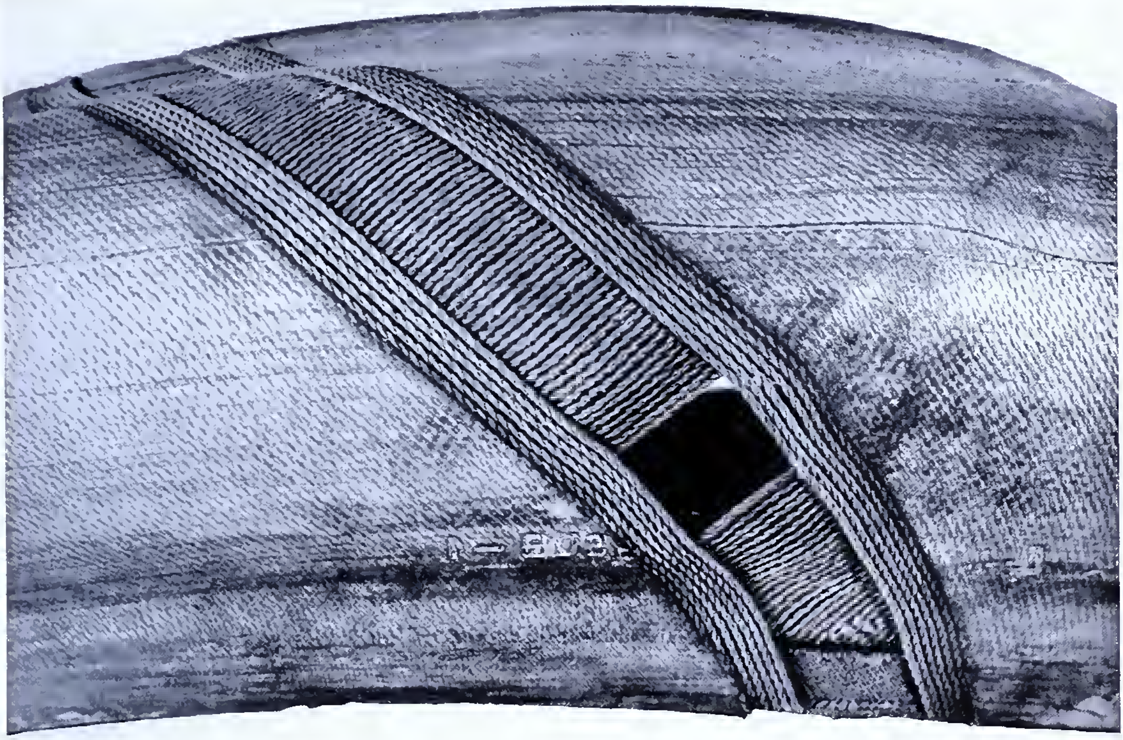

FIG. 33. SHOWING HOW INNER CORDS WERE REMOVED

View taken with tire turned inside out

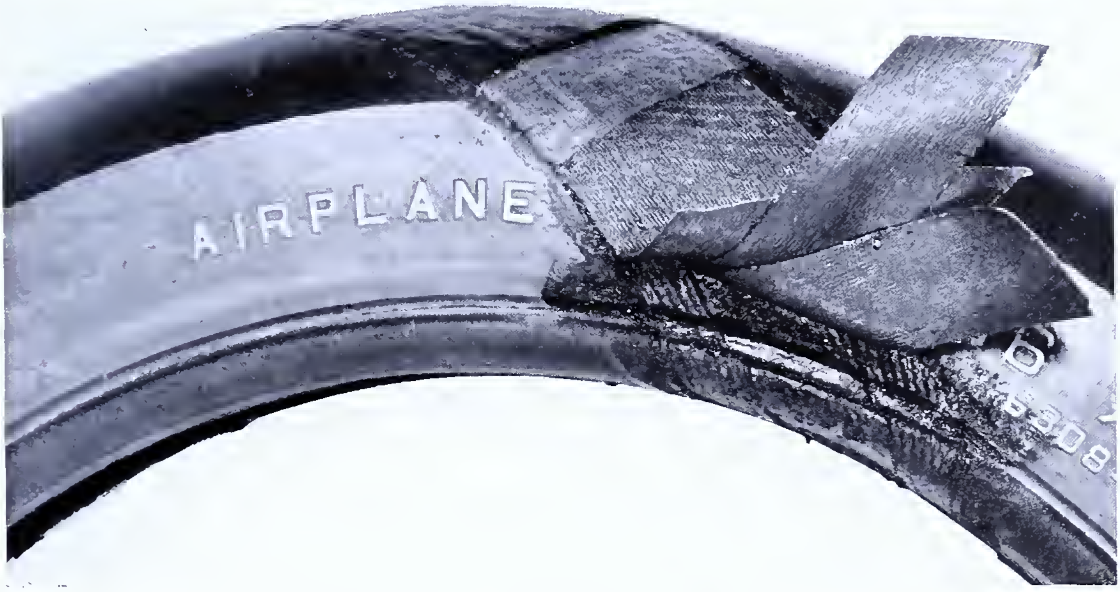

FIG. 34. EXTERIOR OF PARTIALLY COMPLETED REPAIR

Note that after cords were cemented and No. 8300 cushion gum laid in bottom of cord section, two layers of fabric replaced the cords that were taken out, a covering layer of fabric was placed to bind the tire and the repair together, after which a layer of No. 8300 cushion gum and the tread were placed. The side-wall of repair has necessarily been omitted from this illustration.

carried to the toe of the bead. (See Fig. 35.) The tire is now ready to receive the bead strip and cover, side-walls and tread (see Fig. 36), after which it should be cured 45 minutes in the Cavity Vulcanizer and 30 minutes on an Inside Vulcanizer at 60 pounds steam pressure.

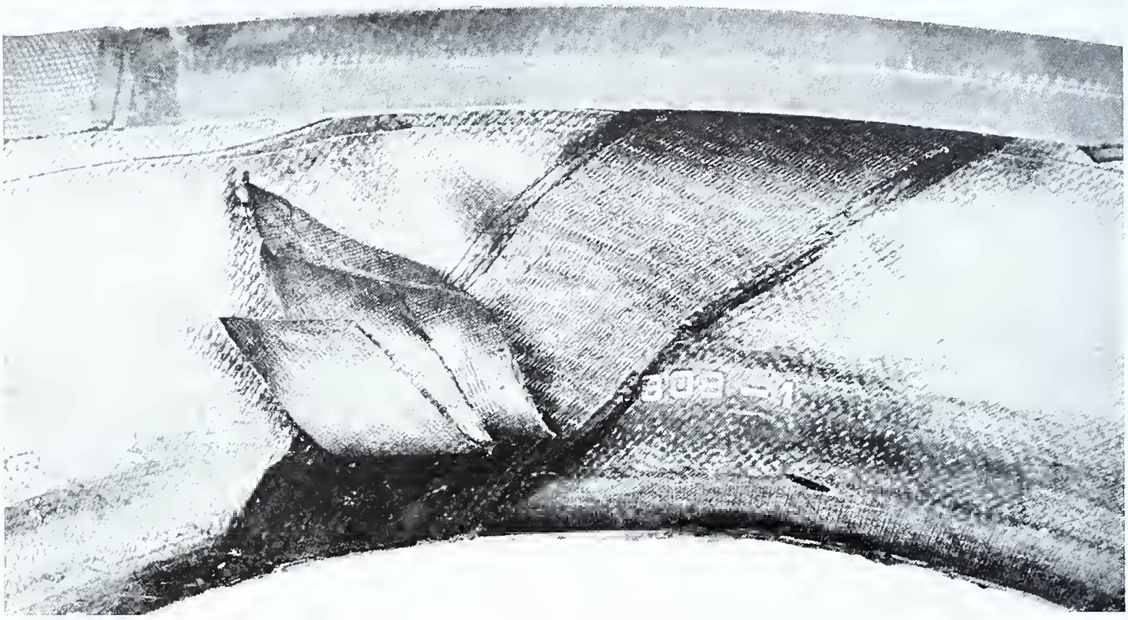

FIG. 35. VIEW OF REPAIR PARTIALLY COMPLETED INSIDE THE TIRE

Cords have been cemented, two layers of fabric placed where cords were taken out, and a covering layer of fabric placed to bind cords and repair together.

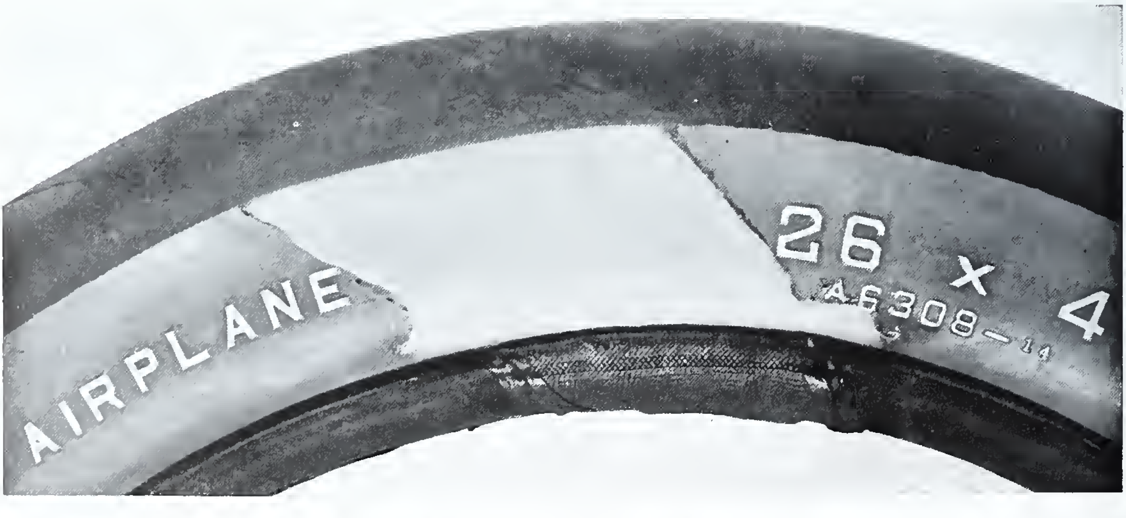

FIG. 36. TREAD GUM, SIDE-WALL AND BEAD COMPLETED READY FOR CURING

Sectional Bead Repair on Clincher Type

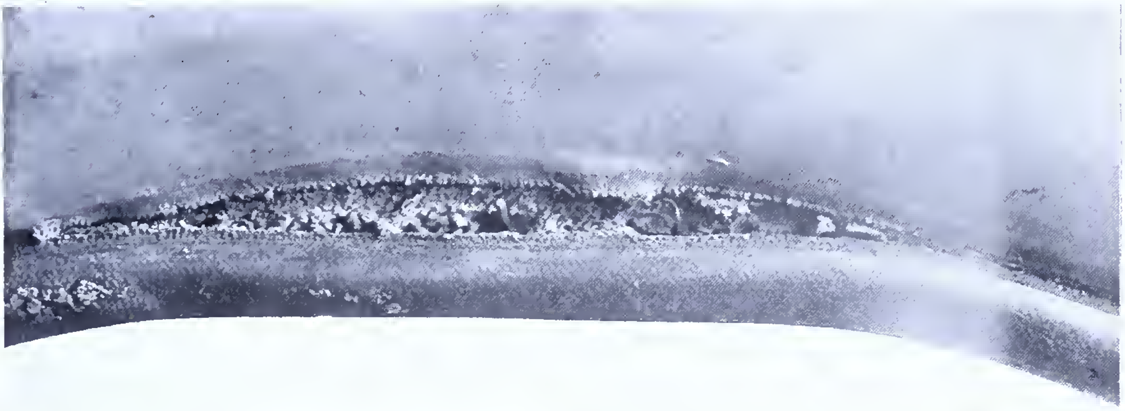

FIG. 37. INJURY TO BEAD

Tearing Down:

Cut away the side wall for about 1¼″ above the injury. Remove the outside bead covers for about 1½″ beyond the rim cut. (Drawing Fig. 21 will show heel, toe and channel of the bead.) Remove the damaged section of the bead by cutting thru the channel and heel at both ends of the injury and splitting the bead at a point half way between the toe and heel. (Fig. 38.) Replace this by a section of the same length, from another bead of the same size. Buff and clean the repair thoroughly.

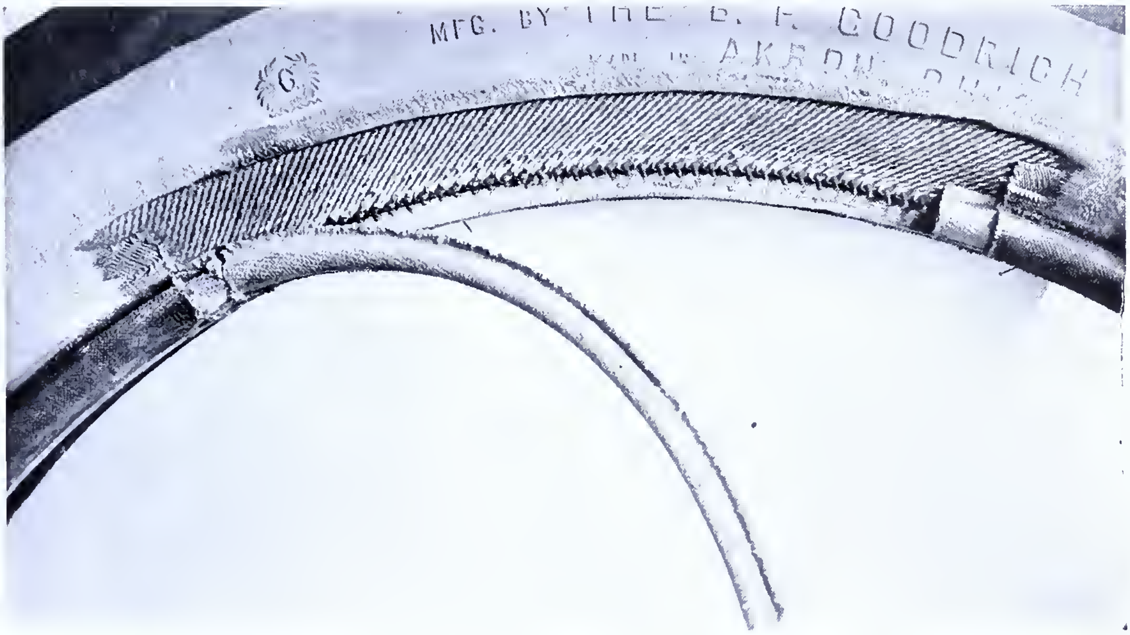

FIG. 38. CORRECT WAY OF TEARING DOWN FOR BEAD REPAIR

Cementing and Building Up:

Apply two medium heavy coats of No. 36157 vulcanizing cement. Cover the cords with one ply of 1/32″ No. 8300 cushion gum; lap a piece of gum over the exposed ends of the bead and fit the bead section into place. Stitch the lip or upper part of bead to the side-wall and form up the channel with a stitcher. Apply the No. 7430 bead cover, permitting it to extend about ½″ above the lip of the bead. (Fig. 39.) Then place the No. 7330 bead cover over the first, extending not quite as far up the side walls as the first cover. Place a ½″ strip of No. 8300 cushion gum over the ends of both covers, binding them together and lapping over on the side-wall. Now build up the removed portion of the side-wall flush with the rest of the side-wall, using No. 8200 side-wall gum.

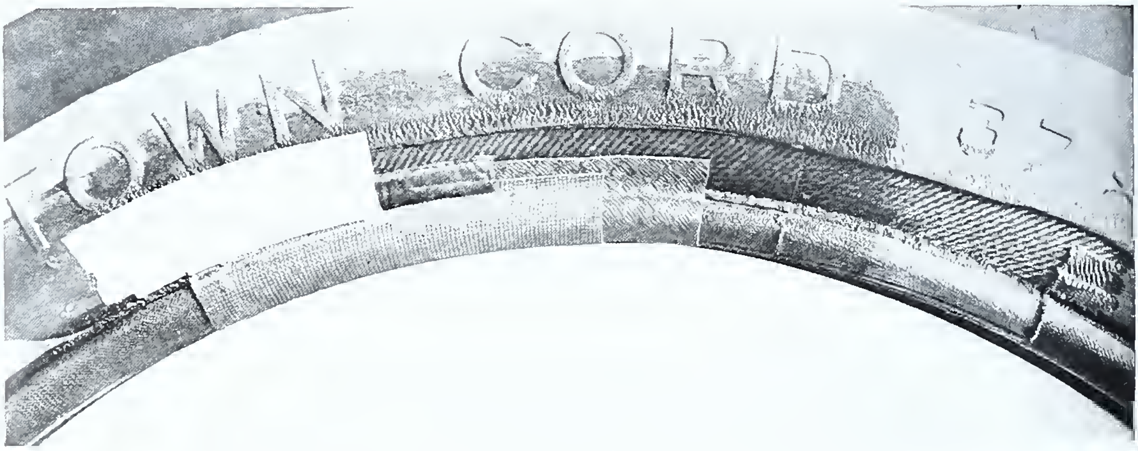

FIG. 39. METHOD OF BUILDING UP SECTIONAL BEAD REPAIR

In cases when the bead is rim cut badly in several places, it is sometimes advisable to remove the entire bead and replace with a new one. This will necessitate the removal of both the outside and inside bead covers.

Curing:

Cure in cavity vulcanizer 45 to 50 minutes at 50 lbs. steam.

Separation of Cord Plies

Tearing Down:

Remove a section of the inside bead covers on one bead. Pull out the staples holding the separated cords and pull the cords back beyond the place where they are separated. (See Fig. 41.) Buff the cords and bead covers clean. Apply two medium coats of No. 36157 vulcanizing cement. After the cement has dried thoroughly, apply one sheet of No. 8300 cushion gum over the outer cords and drop the inner cords back into place. Replace the staples, stitch the cords down well and cover with one ply of $\frac{1}{64}$" No. 8300 cushion stock. Pull the section of inside bead cover over the staples and roll down into place. Cure on an inside vulcanizer about 45 minutes at 50 lbs. steam.

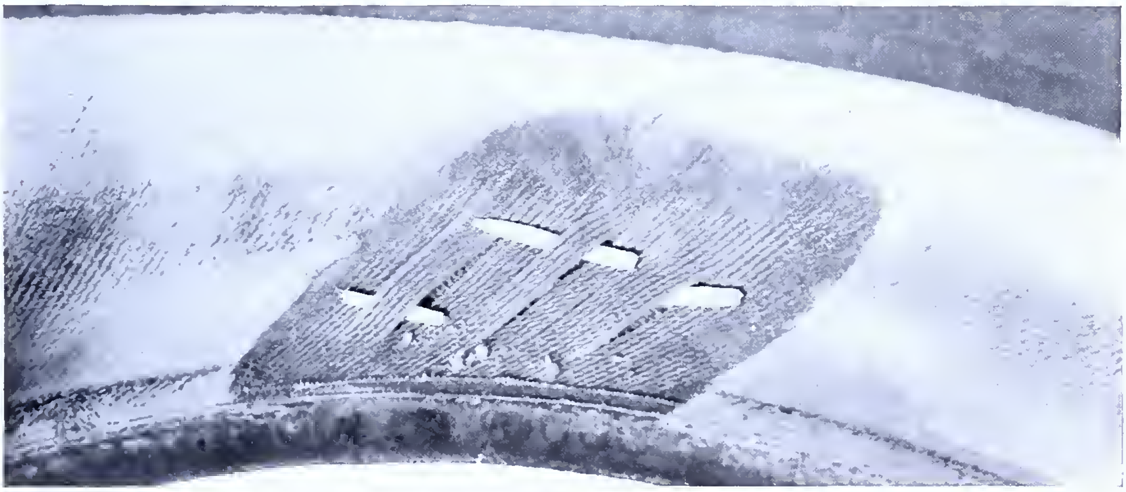

FIG. 40. SEPARATION BETWEEN PLIES

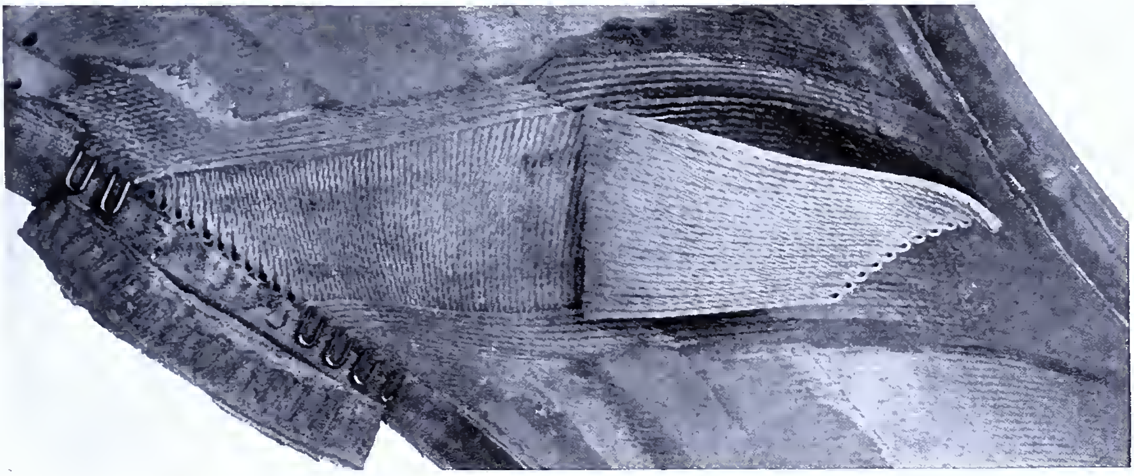

FIG. 41. CORD SEPARATION TORN DOWN FOR REPAIR

Goodrich Cord Repair Material

These materials have been developed particularly for the Cord Tire and have been found, by careful experiments, to give better results than any other materials on the market. Unless the materials hereafter referred to are used in the repair of Cord Tires, and in the manner prescribed, this company reserves the right to withdraw its guarantee.

Cord Tire Repair Stocks:

We furnish these Repair Materials in any width, gauge or quantity.

No. 8100 Cord Tread Gum (Sheeted or Camelback). Sheet $\frac{1}{16}''$ and $\frac{3}{32}''$ (Indicate thickness desired). Camelback (Indicate size of tire).

No. 8200 Gum for Side-Walls, $\frac{1}{32}''$ and $\frac{1}{16}''$ (Indicate thickness).

No. 8300 Gum Cushion for covering Cords, $\frac{1}{64}''$ and $\frac{1}{32}''$ (Indicate thickness desired).

No. 7140 Fabric for Top Breaker Strip, between Tread and Second Breaker, 4-ply, $\frac{5}{32}''$ thick.

No. 7240 Fabric for Second Breaker Strip, between the Cushion Stock and the Top Breaker, 4-ply, $\frac{3}{16}''$ thick.

No. 7330 Fabric for Outside Ply or Chafing Strip on Bead Covers.

No. 7430 Fabric for Inside Ply for Bead Covers.

No. 7520 Fabric for Stiffening Strips over Staples.

No. 36157 Vulcanizing Cement, for all vulcanizing purposes on Cord Tires.

No. 4 Rubber Cement for Cementing in Flaps, etc.

No. 2 Staples for 3½″, 4″ and 4½″ Tires.

No. 4 Staples for 5″ and 5½″ Tires.

Cords for Repairing Cases. (Specify whether for outside or inside ply, and the size and type of tire for which they are to be used.)

Cords for Cord Sections:

"New" Cord sections are taken from the carcasses of used casings.

Always use cords taken from casings of the same cross sectional diameter as the one being repaired, with the exceptions mentioned on Page 13.

Use cords from the inside ply to replace cords taken from the inside. Use cords from the outside ply for outside ply repair work. Wherever cords are to be replaced, first detach a number equal to the number removed and see that they fit.

Cover the detached cord section with one coat of medium No. 36157 Cement. Dry one hour. Apply the second coat and dry from six to eight hours or over night.

These remarks will apply wherever injured cords are to be taken from a case and replaced with good ones.

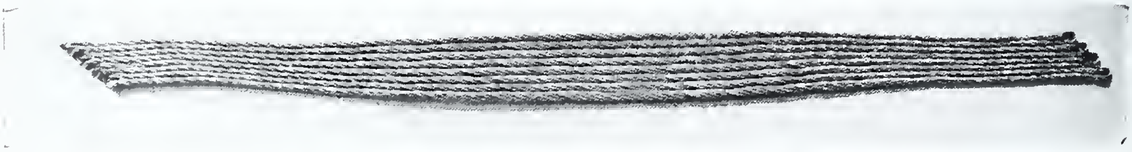

FIG. 42

Directions for the Use of Cord Tire Air Bags

THE endless air bags used in repairing Cord Tires are so constructed, that they are not interchangeable. Every size of Cord Tire has its own specially constructed tube, which will not fit any other size casing, for instance a 37 x 5 air bag will only fit a 37 x 5 tire and cannot be used in a 35 x 5 or 36 x 5 tire.

If an air bag is hard or dry it may be softened by inflating with steam for several minutes.

When not in use all air bags should be laid flat on the floor, never stand them against a wall or crowd them into a narrow rack.

A thin soap solution, made of soap and water, applied to the outer surface of a bag will keep it from sticking in a tire while curing. About a quart of water should be put in each bag, this will prevent the drying out and burning of bag in cure.

Care of Uncured Gum Trimmings

All gum trimmings should be kept separate and free from all foreign matter, for instance little pieces of cured rubber, fabric, dirt, etc. We suggest that two or three retaining boxes with lids be secured for this purpose.

You know that the value of this material when returned to the factory, and the credit allowed, depends entirely upon its condition.

When returning any uncured gum trimmings to the factory, see that they are wrapped in muslin liners or packed in wooden boxes lined with clean paper, so that they will be protected in transit and each bundle or box should be plainly tagged with the number of the gum. If gum stocks are mixed together, it is often impossible to separate them and reclaim to good advantage.

Do not use tread stock for cement. In order to make a successful tread stock, which gives good road wearing, it is necessary to grind a certain amount of mineral compound into the rubber. This has no value for making cement, and will settle to the bottom when dissolved. Tread stock will make the cement a great deal more expensive, as it requires about twice as many pounds of this rubber to make a gallon of cement as would the regular cement stock.

Cutting Repair Gums

When unrolling gum for cutting loosen it from the holland liner on which it has been rolled should you wish to save the liner. If not, cut both liner and gum which makes the pieces easier to handle. Keep it clean and in good condition, if you wish to return it to the factory for credit.

It is advisable to cut the gum the long way or with the length of the roll rather than across the roll.

Cutting Repair Fabric

All fabrics should be cut on a bias in the same manner that fabric is cut for fabric tire construction. Lay the stock on the table, so that its edges are parallel with the edges of the table and cut across the fabric at an angle of 45 degrees.

Care of Repair Stocks

Upon receipt of repair gums and fabrics, remove the rolls of stock from the boxes and suspend them on racks, which should be made for this purpose. Do not allow the rolls of stock to remain in the boxes for any length of time, and do not lay a roll of stock on the floor or stand it on end, as the material will stick to the liner.

It is advisable to work off the old material so as to keep the stock fresh. A good way to do this is to tag each roll with the date received. Do not keep the repair gums and fabric in a warm place, or where they will be exposed to dirt or soapstone. If the stock is dry, freshen it up by wiping with benzine. Let benzine thoroughly evaporate before using stock.

Never keep Repair Material where it will freeze, or it will cause the stock to become stiff and bloom out.

Facts and Pointers for the Guidance of Repair Men

NEVER proceed with repairs while the tire is wet. See that it is thoroughly dried out.

Repairs on large cases cannot be cured through, unless the cure is finished on an inside steam vulcanizer. You can expect failure where this course is not followed.

Use only the best grade of benzine or gasoline. In low grades these will affect your repairs more than you imagine. Complete and rapid evaporative properties are absolutely essential.

Blow the water out of your sectional vulcanizer occasionally. If you do not you will get some erratic cures.

Any air bag used in a size larger case than it is intended for must be properly padded; otherwise you will soon ruin the bag. Always use the proper size for each case.

The life of an air bag can be greatly prolonged if handled properly.

A sectional air bag should never be removed from the case by grabbing hold of the tube. You will tear the tube sooner or later. Take the air bag by its lower end and force it out by putting the hand underneath it.

Round out your air bags with a little air when not in use. This helps preserve them.

When removing a case from the vulcanizer, if it shows a tendency to blister, immerse in water. This will generally overcome the difficulty.

Extensive blistering of a repair usually comes from either improperly cleaning the carcass, moisture in the casing, under-cure, or not allowing the cement to dry. Porous spots indicate insufficient pressure, unevaporated benzine or moisture in the cement.

Repairs will present a much neater appearance if the ragged edges are smoothed off with a file or cloth buffer before the case goes out of your hands.

After cementing a case for repair, do not place in a draft to dry. This allows a hard film or crust to form on the surface of the cement, while it remains soft underneath. Blistering will result.

Dust cases and vulcanizer with soapstone before applying cure. For this purpose put two pounds of soapstone in a cheesecloth bag. It will sift through handily as you need it.

To overcome sticking of an old case to vulcanizer, apply thin coat of No. 4 cement to case and dust with soapstone.

Clean out cavities of your vulcanizer with emery paper occasionally. This will remove all particles of dirt or old gum which otherwise will mar the appearance of your repair.

Do not buy too light equipment. That which will stand extra strains and pressures is going to prove best in the long run even if the initial cost is greater.

Use only the best materials you can procure. Rubber is a vegetable product, called upon to do the work of steel. The best is none too well adapted to the work cut out for it.

Use judgment in advising repairs. Don't make them where you know you are gambling on the ultimate outcome. A bad repair is a black eye for you and the repair business in general.

When applying a tire do not make too free use of soapstone. A quantity of this collecting in one place will generate heat and give the inner tube the appearance of being soft and bubbly and badly defective.

Goodrich repair materials embody the experience of over 48 years in the preparation of high-grade rubber. They may be depended upon under all circumstances.

Dimensions for Cutting Cord Tire Repair Material

Width of No. 8200 Side Wall for Band Retread

Size Tire	Width of Side
3½	1 13/16
4	2⅛
4½	2⅜
5	2⅞
5½	2⅞

No. 8300 Cushion Gum for Cord Cover on Retread

Size	Length	Width	Gauge	Remarks
32 x 3½	8′-0″	4½	1/32	
32 x 4	8′-0″	5	1/32	
33 x 4½	8′-2″	5¾	1/32	In Retreading use one cover only. In Sectional Work cut to fit repair.
36 x 4	9′-0″	5	1/32	
34 x 4	8′-4″	5	1/32	
33 x 4	8′-2″	5	1/32	
34 x 4½	8′-4″	5¾	1/32	
35 x 4½	8′-5″	5¾	1/32	

Size	Length	Width	Gauge	Remarks
36 x 4½	9′-0″	5¾	1/32	In Retreading use one cover only. In Sectional Work cut to fit repair.
37 x 4½	9′-2″	5¾	1/32	
33 x 5	8′-4″	6¼	1/32	
35 x 5	8′-6″	6¼	1/32	
36 x 5	9′-0″	6¼	1/32	
37 x 5	9′-0″	6¼	1/32	
38 x 5½	9′-6″	7	1/32	

Width of No. 7140 and No. 7240 Breakers for Sectional Tread Repairs

Size Tire	7140	Width	7240
3½	3½		Not used
4	3¾		2½
4½	4¼		2¾
5	4¾		3
5½	5		3½

Note—Cut to fit Repair. In the case of band retreads, the Top Breaker is semi-cured in the tread at the factory.

Width of Bead Cover or Chafing Strips

Size Tire	7330	Width	7430
3½	1¾		1⅝
4	2		1⅝
4½	2½		2
5	2½		2
5½	2¾		2

REMARKS—Stiffening Strips No. 7520 over Staples 1¼″ wide.

Curing:

The following are the cures given the various repairs at the factory. These may or may not hold good for the outside repair shops due to different type of equipment used and the steam supply. We advise the making of test cures, in order to ascertain the proper cure.

Retread in Pot Heater—

5 minutes raise to 20 lbs.
40 minutes raise to 45 lbs.
30 minutes cure at 45 lbs.

Sectional work in Cavity Vulcanizer—

1 hour and 30 minutes at 60 lbs. with impression pad.
55 minutes at 50 lbs. without impression pad.

Inside Vulcanizer—45 minutes at 50 lbs.

Sectional Impression Pads

These pads are for use in the cavity vulcanizer to form up the ribbed tread design in the uncured tread section.

They are similar in construction to the endless wrapping pad, with the exception that they are lighter, so as not to affect the curing of the section.

The pads may be either built up by the repairman, or obtained from the factory to fit any cross-section of tread, in lengths of 24″ to 26″.

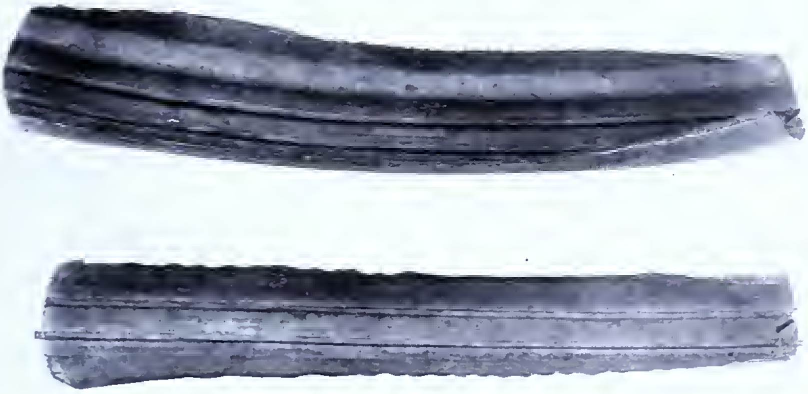

FIG. 43

Buffing Brushes

The construction of "The Economy" or large brush is such that the wire wears down gradually and does not break off in long lengths as is true of many other large brushes.

The "Economy" brush is especially adapted to the buffing of tires cut down for retread. One man with this type of brush will turn out as much work as several men with others.

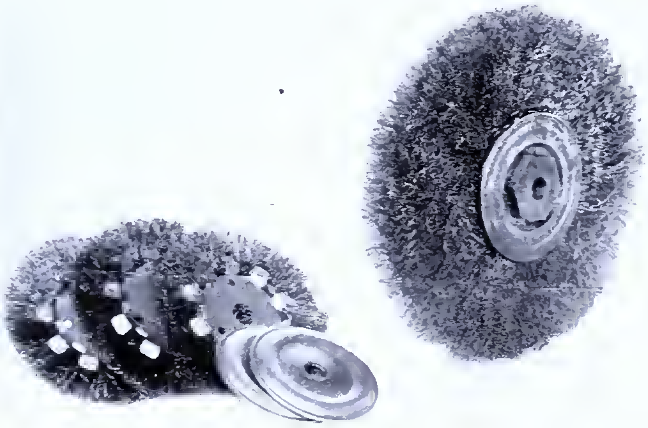

FIG. 44

This brush should be speeded about 1500 to 1800 R. P. M.

The smaller brush or "Advance Wheel" is one of the simplest and best brushes of its type on the market, it will be found very useful in buffing up sectional work and for getting into the corners and places where it is impossible to use the larger brush.

The "Advance" requires no hub or holder—fits on the spindle without any special appliance of any kind. Being made in discs or sections, each section a brush in itself, any desired width of face may be obtained by simply adding on as many sections as necessary.

When ordering buffing brushes always designate diameter of brush and size of arbor hole.

Rotary Rasp

These rasps are very durable and are most useful in roughing up the edges of the gum side walls around a repair or a retread.

They are mounted on the ordinary emery or buffing stand, the spindle of which should not be less than ¾″ diameter. Rotating speed should be from 1500 to 1800 R. P. M. Be sure to mention size of arbor hole when ordering.

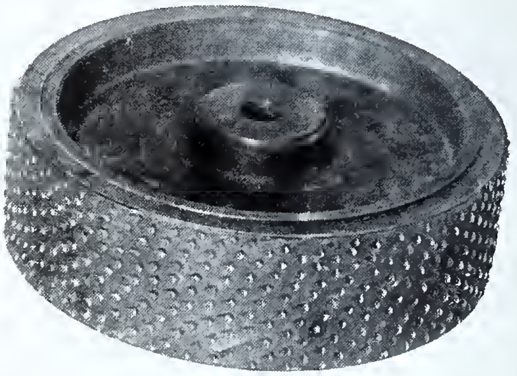

FIG. 45

Sectional Air Bags

Air bags are an essential part of a cavity vulcanizing equipment. Their purpose is to inflate the case at the point of repair and exert sufficient pressure on the new gum to insure its curing properly.

At least 60 lbs of air should be used and as much more as it is possible to obtain. Be absolutely sure that the air bag does not extend beyond the ends of the cavity and that it is properly padded in cases where it would have to stretch in order to fill out the tire.

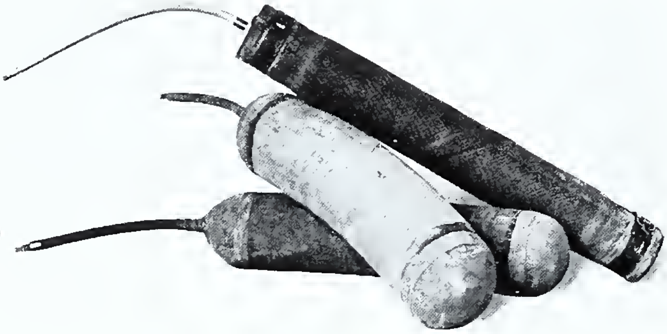

FIG. 46

Goodrich and Diamond Air Bags are made of especially selected material, presenting the highest possible degree of elasticity, combined with toughness and resistance to heat.

In repairing the Cord Tire it is advisable to keep one set of air bags for that purpose only, and they should be of sufficient length to insure a proper pressure at all points of the repair.

For a ⅕ circle cavity use a bag 18″ to 20″ long.
For a ¼ circle cavity use a bag 22″ to 24″ long.

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